KMCT
DENTAL COLLEGE

Recognised Research Centre of Kerala University of Health Sciences
Recognised by Dental Council of India and Govt. of India
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TO WHOM SO EVER IT MAY CONCERN

This is to certify that the information in the attached documents is verified by me and is true to the best of my knowledge.

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CALICUT

Principal

Dr. MANOJ KUMAR.K.P
Principal
KMCT Dental College
Manassery, Mukkam

DENTAL COUNCIL OF INDIA

BDS COURSE REGULATIONS 2007

DENTAL COUNCIL OF INDIA
Temple Lane, Kotla Road
New Delhi – 110 002

Mechanic)															
Dent. Hygst.											5				5
Radiographer											3				3
Photographer										1					1
Artist										1					1
Programmer												1			1
Data Entry Operators												2			2
Physical Director														1	1
Engineer								1							1
Electricians								4							4
Plumber								2							2
Carpenter								1							1
Mason								1							1
A.C. Tech.								1							1
Helpers Electrical								3							3
Sweepers & Scavangers							2	4			5		6		17
Attenders	3	1	1		1	2	2	3			5	1	6		25
Security Personal									6						6
Dept. Secretaries											8				8
Driver									5						5
Nurses											9				9
Lab. Technicians													5		5

Note:
The above staff pattern indicates minimum requirements for the stipulated admissions. However, the actual staff requirements may marginally vary depending upon the patients' flow, work culture and design of the building.

SYLLABUS OF STUDY

1. HUMAN ANATOMY, EMBRYOLOGY, HISTOLOGY & MEDICAL GENETICS

A) GOAL

The students should gain the knowledge and insight into, the functional anatomy of the normal human head and neck, functional histology and an appreciation of the genetic basis of inheritance and disease, and the embryological development of clinically important structures. So that relevant anatomical & scientific foundations are laid down for the clinical years of the BDS course.

B) OBJECTIVES :

a) KNOWLEDGE & UNDERSTANDING:

At the end of the 1st year BDS course in Anatomical Sciences the undergraduate student is Expected to:

1. Know the normal disposition of the structures in the body while clinically examining a patient and while conducting clinical procedures.
2. Know the anatomical basis of disease and injury.
3. Know the microscopic structure of the various tissues, a pre-requisite for understanding of the disease processes.
4. Know the nervous system to locate the site of lesions according to the sensory and or motor deficits encountered.
5. Have an idea about the basis of abnormal development, critical stages of development, effects of teratogens, genetic mutations and environmental hazards.
6. Know the sectional anatomy of head neck and brain to read the features in radiographs and pictures taken by modern imaging techniques.
7. Know the anatomy of cardio-pulmonary resuscitation.

b) SKILLS

1. To locate various structures of the body and to mark the topography of the living anatomy.
2. To identify various tissues under microscope.
3. To identify the features in radiographs and modern imaging techniques.
4. To detect various congenital abnormalities.

C) INTEGRATION

By emphasising on the relevant information and avoiding unwanted details, the anatomy taught integrally with other basic sciences & clinical subjects not only keeps the curiosity alive in the learner but also lays down the scientific foundation for making a better doctor, a benefit to the society.

This insight is gained in a variety of ways:

1) Lectures & small group teaching
2) Demonstrations
3) Dissection of the human cadaver
4) Study of dissected specimens

5) Osteology
6) Surface anatomy on living individual
7) Study of radiographs & other modern imaging techniques.
8) Study of Histology slides.
9) Study of embryology models
10) Audio-visual aids

Throughout the course, particular emphasis is placed on the functional correlation, clinical application & on integration with teaching in other bio dental disciplines.

D) AN OUTLINE OF THE COURSE CONTENT:

1. General anatomy: Introduction of anatomical terms and brief outline of various systems of the body.
2. Regional anatomy of head & neck with osteology of bones of head & neck, with emphasis on topics of dental importance.
3. General disposition of thoracic, abdominal & pelvic organs.
4. The regional anatomy of the sites of intramuscular & intra vascular injections, & lumbar puncture.
5. General embryology & systemic embryology with respect to development of head & neck.
6. Histology of basic tissues and of the organs of gastroinstenstinal, respiratory, Endocrine, excretory systems & gonads.
7. Medical genetics.

E) FURTHER DETAILS OF THE COURSE.

I. INTRODUCTION TO :

1. Anatomical terms.
2. Skin, superficial fascia & deep fascia
3. Cardiovascular system, portal system collateral circulation and arteries.
4. Lymphatic system, regional lymph nodes
5. Osteology - Including ossification & growth of bones
6. Myology – Including types of muscle tissue & innervation.
7. Syndesmology – Including classification of Joints.
8. Nervous system

II. HEAD & NECK:

01. Scalp, face & temple, lacrimal apparatus 02. Neck - Deep fascia of neck, posterior triangle, suboccipital triangle, anterior triangle, anterior median region of the neck, deep structures in the neck. 03.Cranial cavity - Meninges, parts of brain, ventricles of brain, dural venous sinuses, cranial nerves attached to the brain, pituitary gland. 04. Cranial nerves - III, IV, V, VI, VII, IX,XII in detail. 05. Orbital cavity – Muscles of the eye ball, supports of the eye ball, nerves and vessels in the orbit. 06. Parotid gland. 07. Temporo mandibular joint, muscles of mastication, infratemporal fossa, pterygo - palatine fossa. 08. Submandibular region 09. Walls of the nasal cavity, paranasal air sinuses 10. Palate 11. Oral cavity, Tongue 12. Pharynx (palatine tonsil and the auditory tube) Larynx. OSTEOLOGY – Foetal skull, adult skull, individual bones of the skull, hyoid bone and cervical vertebrae

III.THORAX : Demonstration on a dissected specimen of

1. Thoracic wall
2. Heart chambers
3. Coronary arteries
4. Pericardium
5. Lungs – surfaces ; pleural cavity
6. Diaphragm

IV. ABDOMEN : Demonstration on a dissected specimen of

1. Peritoneal cavity
2. Organs in the abdominal & pelvic cavity.

V. CLINICAL PROCEDURES :

a) Intramuscular injections: Demonstration on a dissected specimen and on a living person of the following sites of injection.
   1. Deltoid muscle and its relation to the axillary nerve and radial nerve.
   2. Gluteal region and the relation of the sciatic nerve.
   3. Vastus lateralis muscle.
b) Intravenous injections & venesection: Demonstration of veins in the dissected specimen and on a living person.

1. Median cubital vein 2. Cephalic vein 3. Basilic vein 4. Long saphenous vein

c) Arterial pulsations: Demonstration of arteries on a dissected specimen and feeling of pulsation of the following arteries on a living person.

1. Superficial temporal 2. Facial 3. Carotid 4. Axillary 5. Brachial 6. Radial 7. Ulnar 8. Femoral 9. Popliteal 10. Dorsalispedis

d) Lumbar puncture: Demonstration on a dissected specimen of the spinal cord, cauda equina & epidural space and the inter vertebral space between L4 & L5 .

VI. EMBRYOLOGY :

Oogenesis, Spermatogenesis, Fertilisation, Placenta, Primitive streak, Neural crest, Bilaminar and trilaminar embryonic disc, Intra embryonic mesoderm - formation and fate, notochord formation & fate, Pharyngeal arches, pouches & clefts, Development of face, tongue, palate, thyroid gland, pituitary gland, salivary glands, and anomalies in their development, Tooth development in brief.

VII. HISTOLOGY :

The Cell :

Basic tissues - Epithelium, Connective tissue including cartilage and bone, Muscle Tissue, Nervous tissue : Peripheral nerve, optic nerve, sensory ganglion, motor ganglion, Skin

Classification of Glands

Salivary glands (serous, mucous and mixed gland), Blood vessels, Lymphoid tissue Tooth, lip, tongue, hard palate, oesphagus, stomach, ,duodenum ,ileum, colon, vermiform appendix Liver, Pancreas, Lung, Trachea ,Epiglottis, Thyroid gland , para thyroid gland , supra renal gland and pituitary gland, Kidney, Ureter, Urninary bladder, Ovary and testis.

VIII. MEDICAL GENETICS :

Mitosis, meiosis, Chromosomes, gene structure, Mendelism, modes of inheritance

RECOMMENDED BOOKS:

1. SNELL (Richard S.) Clinical Anatomy for Medical Students, Ed. 5, Llittle Brown & company, Boston.
2. RJ LAST'S Anatomy – McMinn, 9th edition.
3. ROMANES(G.J.) Cunningham Manual of Practical Anatomy : Head & Neck & Brain Ed.15.Vol.III, Oxford Medical publication.
4. WHEATER,BURKITT & DANIELS, Functional Histology, Ed. 2, Churchill Livingstone.
5. SADLER , LANGMAN'S, Medical Embryology, Ed. 6.
6. JAMES E ANDERSON, Grant's Atlas of Anatomy. Williams & Wilkins.
7. WILLIAMS, Gray's Anatomy, Ed.38. ,Churchill Livingstone.
8. EMERY,Medical Genetics.

2. HUMAN PHYSIOLOGY

A) GOAL

The broad goal of the teaching undergraduate students in Human Physiology aims at providing the student comprehensive knowledge of the normal functions of the organ systems of the body to facilitate an understanding of the physiological basis of health and disease.

OBJECTIVES

a) KNOWLEDGE

At the end of the course, the student will be able to:

1. Explain the normal functioning of all the organ systems and their interactions for well co-ordinated total body function.
2. Assess the relative contribution of each organ system towards the maintenance of the milieu interior.
3. List the physiological principles underlying the pathogenesis and treatment of disease.

b) SKILLS

At the end of the course, the student shall be able to :

1. Conduct experiments designed for the study of physiological phenomena.
2. Interprete experimental and investigative data
3. Distinguish between normal and abnormal data derived as a result of tests which he/she has performed and observed in the laboratory.

c) INTEGRATION

At the end of the integrated teaching the student shall acquire an integrated knowledge of organ structure and function and its regulatory mechanisms.

B) COURSE CONTENTS THEORY

1. GENERAL PHYSIOLOGY
    1. Homeostasis: Basic concept, Feed back mechanisms
    2. Structure of cell membrane, transport across cell membrane
    3. Membrane potentials

2. BLOOD:

Composition & functions of blood.
Specific gravity, Packed cell volume, factors affecting & methods of determination.
Plasma proteins - Types, concentration, functions & variations.
Erythrocyte - Morphology, functions & variations. Erythropoiesis & factors affecting erythropoiesis.
ESR- Methods of estimation, factors affecting, variations & significance.
Haemoglobin - Normal concentration, method of determination & variation in concentration.
Blood Indices - MCV, MCH, MCHC - definition, normal values, variation.

Anaemia - Definition, classification, life span of RBC's destruction of RBC's , formation & fate of bile pigments, Jaundice - types.
Leucocytes : Classification, number, percentage, distribution morphology, properties, functions & variation. Role of lymphocytes in immunity , leucopoiesis life span & fate of leucocytes.
Thromobocytes - Morphology, , number, variations, function & thrombopoiesis.
Haemostatsis - Role of vasoconstriction, platelet plug formation in haemostasis, coagulation factors, intrinsic & extrinsic pathways of coagulation, clot retraction.
Tests of haemostatic function, platelet count, clotting time, bleeding time, prothrombin time - normal values, method & variations. Anticoagulants - mechanism of action. Bleeding disorders.
Blood groups: ABO & Rh system, method of determination, importance,indications & dangers of blood transfusion, blood substitutes.
Blood volume: Normal values, variations.
Body fluids : distribution of total body water, intracellular & extracellular compartments, major anions & cations in intra and extra cellular fluid.
Tissue fluids & lymph : Formation of tissue fluid, composition, circulation & functions of lymph. Oedema - causes.
Functions of reticulo endotrelial system.

3. MUSCLE AND NERVE
Classification of nerves, structure of skeletal muscle - Molecular mechanism of muscle contraction, neuromuscular transmission. Properties of skeletal muscle. Structure and properties of cardiac muscle & smooth muscle.

4. DIGESTIVE SYSTEM :
Introduction to digestion : General structure of G.I. tract, Innervation.
Salivary glands: Structure of salivary glands, composition , regulation of secretion & functions of saliva.
Stomach: Composition and functions of gastric juice, mechanism and regulation of gastric secretion.
Exocrine Pancreas - Structure, composition of pancreatic juice, functions of each component, regulation of pancreatic secretion.
Liver : structure , composition of bile, functions of bile, regulation of secretion –
Gall bladder : structure, functions.
Small intestine - Composition, functions & regulation of secretion of intestinal juice.
Large intestine - Functions.
Motor functions of GIT: Mastication, deglutition, gastric filling & emptying, movements of small and large intestine, defecation.

5. EXCRETORY SYSTEM :
Structure & functions of kidney, functional unit of kidney & functions of different parts.
Juxta glomerular apparatus, renal blood flow.
Formation of Urine : Glomerular filteration rate - definition, determination , normal values, factors influencing G.F.R. Tubular reabsorption - Reabsorption of sodium, glucose, water & other substances. Tubular secretion - secretion of urea, hydrogen and other substances.
Mechanism of concentration & dilution of urine.
Role of kidney in the regulation of pH of the blood.
Micturition : anatomy & innervation of Urinary bladder, mechanism of miturition & abonrmalities.

6. BODY TEMPERATURE & FUNCTIONS OF SKIN

7. ENDOCRINOLOGY
General endocrinology - Enumeration of endocrine glands & hormones - General functions of endocrine system, chemistry, mechanism of secretion, transport, metabolism, regulation of secretion of hormones.
Hormones of anterior pituitary & their actions, hypothamic regulation of anterior pituitary function. Disorders of secretion of anterior pituitary hormones.
Posterior pituitary : Functions, regulation & disorders of secretion.
Thyroid: Histology, synthesis, secretion & transport of hormones, actions of hormones, regulation of secretion & disorders, Thyroid function tests.
Adrenal cortex & Medulla -synthesis, secretion, action, metabolism, regulation of secretion of hormones & disorders.
Other hormones - Angiotensin, A.N.F.

8. REPRODUCTION
Sex differentiation, Physiological anatomy of male and female sex organs,
Female reproductive system : Menstrual cycle, functions of ovary, actions of oestrogen & Progesterone, control of secretion of ovarian hormones, tests for ovulation, fertilisation, implantation, maternal changes during pregnancy, pregnancy tests & parturition.
Lactation, composition of milk, factors controlling lactation, milk ejection, reflex, Male reproductive system :spermatogenesis, semen and contraception.

9. CARDIO VASCULAR SYSTEM
Functional anatomy and innervation of heart Properties of cardiac muscle
Origin & propagation of cardiac impulse and heart block.
Electrocardiogram - Normal electrocardiogram. Two changes in ECG in myocardial infarction.

Cardiac cycle - Phases, Pressure changes in atria, ventricles & aorta.
Volume changes in ventricles. Jugular venous pulse, arterial pulse.
Heart sounds: Mention of murmurs.
Heart rate: Normal value, variation & regulation.
Cardiac output: Definition, normal values, one method of determination, variation, factors affecting heart rate and stroke volume.
Arterial blood pressure: Definition, normal values & variations,determinants, regulation & measurement of blood pressure.
Coronary circulation.
Cardio vascular homeostasis - Exercise & posture.

10. RESPIRATORY SYSTEM
Physiology of Respiration : External & internal respiration.
Functional anatomy of respiratory passage & lungs.
Respiratory movements: Muscles of respiration, Mechanism of inflation & deflation of lungs.
Intra pleural & intra pulmonary pressures & their changes during the phases of respiration.
Mechanics of breathing - surfactant, compliance & work of breathing.
Spirometry: Lung volumes & capacities definition, normal values, significance, factors affecting vital capacity, variations in vital capacity, FEV & its variations.
Pulmonary ventilation - alveolar ventilation & dead space – ventilation.
Composition of inspired air, alveolar air and expired air.
Exchange of gases: Diffusing capacity, factors affecting it.
Transport of Oxygen & carbon dioxide in the blood.
Regulation of respiration – neural & chemical.
Hypoxia, cyanosis, dyspnoea, periodic breathing.
Artificial respiration, pulmonary function tests.

11. CENTRAL NERVOUS SYSTEM
1. Organisation of central nervous system
2. Neuronal organisation at spinal cord level
3. Synapse receptors, reflexes, sensations and tracts
4. Physiology of pain
5. Functions of cerebellum, thalamus, hypothalamus and cerebral cortex.
6. Formation and functions of CSF
7. Autonomic nervous system

12. SPECIAL SENSES
Fundamental knowledge of vision, hearing, taste and smell.

PRACTICALS
The following list of practical is minimum and essential. All the practical have been categorised as procedures and demonstrations. The procedures are to be performed by the students during practical classes to acquire skills. All the procedures are to be included in the University practical examination. Those categorised as demonstrations are to be shown to the students during practical classes. However these demonstrations would not be included in the University examinations but question based on this would be given in the form of charts, graphs and calculations for interpretation by the students.

PROCEDURES
1. Enumeration of Red Blood Cells
2. Enumeration of White Blood Cells
3. Differential leucocyte counts
4. Determination of Haemoglobin
5. Determination of blood group
6. Determination of bleeding time and clotting time
7. Examination of pulse
8. Recording of blood pressure.

DEMONSTRATION:
1. Determination of packed cell volume and erythrocyte sedimentation rate
2. Determination of specific gravity of blood
3. Determination of erythrocyte fragility
4. Determination of vital capacity and timed vital capacity
5. Skeletal muscle experiments.
   Study of laboratory appliances in experimental physiology. Frog's gastrocneminus sciatic preparation. Simple muscle curve, effects of two successive stimuli, effects of increasing strength of stimuli, effects of temperature, genesis of fatigue and tetanus. Effect of after load and free load on muscle contraction, calculation of work done.
6. Electrocardiography: Demonstration of recording of normal Electro cardiogram
7. Clinical examination of cardiovascular and respiratory system.

TEXT BOOKS:
Guyton; Text book of Physiology, 9th edition.

Ganong; Review of Medical Physiology, 19th edition
Vander; Human physiology, 5th edition
Choudhari; Concise Medical Physiology, 2nd edition
Chaterjee; Human Physiology, 10th edition
A.K. Jain; Human Physiology for BDS students, 1st edition

BOOKS FOR REFERENCE:

i) Berne & Levey; Physiology, 2nd edition
ii) West-Best & Taylor's, Physiological basis of Medical Practise, 11th edition

EXPERIMENTAL PHYSIOLOGY:

i) Rannade; Practical Physiology, 4th edition
ii) Ghai; a text book of practical physiology
iii) Hutchison's; Clinical Methods, 20th edition

BIOCHEMISTRY

AIMS AND SCOPE OF THE COURSE IN BIOCHEMISTRY

The major aim is to provide a sound but crisp knowledge on the biochemical basis of the life processes relevant to the human system and to dental/medical practice. The contents should be organised to build on the already existing information available to the students in the pre-university stage and reorienting. A mere rehash should be avoided.

The chemistry portion should strive towards providing information on the functional groups, hydrophobic and hydrophilic moieties and weak valence forces that organise macromolecules. Details on structure need not be emphasised.

Discussion on metabolic processes should put emphasis on the overall change, interdependence and molecular turnover. While details of the steps may be given, the student should not be expected to memorise them. An introduction to biochemical genetics and molecular biology is a must but details should be avoided. The exposure to antivitamins, antimetabolites and enzyme inhibitors at this stage, will provide a basis for the future study of medical subjects. An overview of metabolic regulation is to be taught by covering hormonal action, second messengers and regulation of enzyme activities. Medical aspects of biochemistry should avoid describing innumerable functional tests, most of which are not in vogue. Cataloguing genetic disorders under each head of metabolism is unnecessary. A few examples which correlate genotype change to functional changes should be adequate.

At the end of the course the student would be able to acquire a useful core of information, which can be retained for a long time. Typical acid tests can be used to determine what is to be taught or what is to be learnt. A few examples are given below.

1. Need not know the structure of cholesterol. Should know why it cannot be carried free in plasma.
2. Mutarotation should not be taught. Student should know why amylase will not hydrolyse cellulose.
3. Need not know the details of alpha - helix and beta - pleats in proteins.
   Should know why haemoglobin is globular and keratin is fibrous.
4. Need not know mechanism of oxidative phosphorylation.
   Should know more than 90 % of ATP is formed by this process.
5. Need not know details of the conversion of pepsinogen to pepsin.
   Should know hydrochloric acid cannot break a peptide bond at room temperature.
6. Need not remember the steps of glycogenesis.
   Should know that excess intake of carbohydrate will not increase glycogen level in liver or muscle.
7. Need not know about urea or cretinine clearance tests.
   Should know the basis of increase of urea and creatinine in blood in renal insufficiency.
8. Need not know the structure of insulin.
   Should know why insulin level in circulation is normal in most cases of maturity onset diabetes.
9. Need not know the structural details of ATP.
   Should know why about 10 g of ATP in the body at any given time meets all the energy needs.
10. Need not know the mechanism of action of prolylhydroxylase.
    Should know why the gum bleeds in scurvy.
11. Need not know the structure of Vitamin K.
    Should know the basis of internal bleeding arising due to its deficiency.
12. Need not remember the structure of HMGCoA.
    Should know why it does not lead to increased cholesterol synthesis in starvation.

BIOCHEMISTRY AND NUTRITION

1. CHEMISTRY OF BIOORGANIC MOLECULES

Carbohydrates: Definition, biological importance and classification. Monosaccharides - Isomerism, anomerism. Sugar derivatives, Disaccharides. Polysaccharides. Structures of starch and glycogen.

Lipids : Definition, biological importance and classification. Fats and fatty acids. Introduction to compound lipids. Hydrophobic and hydrophilic groups. Cholesterol. Bile salts. Micelle. Bimolecular leaflet.

Proteins: Biological importance. Aminoacids: Classification. Introduction to peptides. Proteins : Simple and conjugated; globular and fibrous. Charge properties. Buffer action . Introduction to protein conformation . Denaturation.
Nucleic acids: Building units . Nucleotides. Outline structure of DNA and RNA.
High energy compounds: ATP , Phosphorylamidines, Thiolesters, Enol phosphates.

2. MACRONUTERIENTS AND DIGESTION
Energy needs: Basal metabolic rate. Dietary carbohydrates, fibres. Dietary lipids, essential fatty acids. Nitrogen balance. Essential amino acids. Protein quality and requirement (methods for evaluation of protein quality to be excluded). Protein calorie malnutrition. Balanced diet.
Enzymatic hydrolysis of dietary carbohydrates. Mechanism of uptake of monosaccharides. Digestion and absorption of triacylglycerols. Enzymatic hydrolysis of dietary proteins and uptake of amino acids.

3. MICRONUTRIENTS
Vitamins: Definition, classification, daily requirement, sources and deficiency symptoms. Brief account of water-soluble vitamins with biochemical functions. Vitamins A functions including visual process. Vitamin D and its role in calcium metabolism. Vitamin E. Vitamin K and gamma carboxylation. Introduction to antivitamins and hypervitaminosis.

Minerals :Classification, daily requirement. Calcium and phosphate: sources, uptake, excretion, function. Serum calcium regulation. Iron: sources, uptake and transport.
Heme and nonheme iron functions; deficiency. Iodine: Brief introduction to thyroxine synthesis. General functions of thyroxine. Fluoride: function, deficiency and excess. Indications of role of other minerals.

4. ENERGY METABOLISM
Overview: Outlines of glycolysis, pyruvate oxidation and citric acid cycle. Beta oxidation of fatty acids. Electron transport chain and oxidative phosphyorylation. Ketone body formation and utilisation. Introduction to glycogenesis, glycogenolysis, fatty acid synthesis, lipogenesis and lipolysis. Gluconeogenesis. Lactate metabolism . Protein utilisation for energy. Glucogenic and ketogenic amino acids. Integration of metabolism.

5. SPECIAL ASPECTS OF METABOLISM
Importance of pentose phosphate pathway. Formation of glucuronic acid. Outlines of cholesterol synthesis and breakdown. Ammonia metabolism. Urea formation. Phosphocreatine formation. Transmethylation. Amines. Introduction to other functions of amino acids including one carbon transfer. Detoxication : Typical reactions. Examples of toxic compounds. Oxygen toxicity

6. BIOCHEMICAL GENETICS AND PROTEIN SYNTHESIS
Introduction to nucleotides; formation and degradation. DNA as genetic material. Introduction to replication and transcription. Forms and functions of RNA. Genetic code and mutation. Outline of translation process. Antimetabolites and antibiotics interfering in replication, transcription and translation. Introduction to cancer, viruses and oncogenes.

7. ENZYME AND METABOLIC REGULATION
Enzymes: Definition, classification, specificity and active site. Cofactors. Effect of pH, temperature and substrate concentration. Introduction to enzyme inhibitors, proenzymes and isoenzymes. Introduction to allosteric regulation, covalent modification and regulation by induction/repression.

Overview of hormones. Introduction to second messengers, cyclic AMP, calcium ion, inositol triphosphate. Mechanism of action of steroid hormones, epinephrine, glucagon and insulin in brief. Acid base regulation. Electrolyte balance.

8. STRUCTURAL COMPONENTS AND BLOOD PROTEINS
Connective tissue: Collagen and elastin. Glycosaminoglycans. Bone structure. Structure of membranes. Membrane associated processes in brief. Exocytosis and endocytosis. Introduction to cytoskeleton. Myofibril and muscle contraction in brief.

Haemoglobin: functions. Introduction to heme synthesis and degradation. Plasma proteins: classification and separation. Functions of albumin. A brief account of immunoglobulins. Plasma lipoproteins: Formation, function and turnover.

9. MEDICAL BIOCHEMISTRY
Regulation of blood glucose. Diabetes mellitus and related disorders. Evaluation of glycemic status. Hyperthyroidism and hypothyroidism: Biochemical evaluation. Hyperlipoproteinemias and atherosclerosis, Approaches to treatment. Jaundice: Classification and evaluation. Liver function tests: Plasma protein pattern, serum enzymes levels. Brief introduction to kidney function tests and gastric function tests. Acid base imbalance. Electrolyte imbalance: evaluation. Gout. Examples of genetic disorders including lysosomal storage disorders, glycogen storage disorders, glucose 6- phosphate dehydrogenase deficiency, hemoglobinopathies, inborn errors of amino acid metabolism and muscular dystrophy (one or two examples with biochemical basis will be adequate). Serum enzymes in diagnosis.

PRACTICALS: Contact hours 50

1. Qualitative analysis of carbohydrates 4
2. Color reactions of proteins and amino acids 4

3.	Identification of nonprotein nitrogen substance	4
4.	Normal constituents of urine	4
5.	Abnormal constituents of urine	4
6.	Analysis of saliva including amylase	2
7.	Analysis of milk Quantitative estimations	2
8.	Titrable acidity and ammonia in urine	2
9.	Free and total acidity in gastric juice	2
10.	Blood glucose estimation	2
11.	Serum total protein estimation	2
12.	Urine creatinine estimation Demonstration	2
13.	Paper electrophoresis charts/clinical data evaluation	2
14.	Glucose tolerance test profiles	2
15.	Serum lipid profiles	1
16.	Profiles of hypothyrodisim and hyperthyrodisim	1
17.	Profiles of hyper and hypoparathyrodism	1
18.	Profiles of liver function	1
19.	Urea, uric acid creatinine profile in kidney disorders	1
20.	Blood gas profile in acidosis/ alkalosis	1

RECOMMEDED BOOKS:

1. Concise text book of Biochemistry (3rd edition) 2001, T.N. Pattabiraman
2. Nutritional Biochemistry 1995, S. Ramakrishnan and S.V. Rao
3. lecture notes in Biochemistry 1984, J.K. Kandlish

Reference books:

1. Text book of Biochemistry with clinical correlations 1997, T.N. Devlin
2. Harper's Biochemistry, 1996., R.K. Murray et.al
3. Basic and applied Dental Biochemistry, 1979, R.A.D. Williams & J.C.Elliot

3. DENTAL ANATOMY, EMBRYOLOGY AND ORAL HISTOLOGY

INTRODUCTION

Dental Anatomy including Embryology and Oral Histology – a composite of basic Dental Sciences & their clinical applications.

SKILLS

The student should acquire basic skills in :

1. Carving of crowns of permanent teeth in wax.
2. Microscopic study of Oral tissues.
3. Identification of Deciduous & Permanent teeth.
4. Age estimation by patterns of teeth eruption from plaster casts of different age groups.

OBJECTIVES

After a course on Dental Anatomy including Embryology and Oral Histology,

1. The student is expected to appreciate the normal development, morphology, structure & functions of oral tissues & variations in different pathological/non-pathological states.
2. The student should understand the histological basis of various dental treatment procedures and physiologic ageing process in the dental tissues.
3. The students must know the basic knowledge of various research methodologies.

I. TOOTH MORPHOLOGY

1. Introduction to tooth morphology:

♦ Human dentition, types of teeth, & functions, Palmer's & Binomial notation systems, tooth surfaces, their junctions - line angles & point angles, definition of terms used in dental morphology, geometric concepts in tooth morphology, contact areas & embrasures - Clinical significance.

2. Morphology of permanent teeth :

• Description of individual teeth, along with their endodontic anatomy & including a note on their chronology of development, differences between similar class of teeth & identification of individual teeth.
• Variations & Anomalies commonly seen in individual teeth.

3. Morphology of Deciduous teeth :

♦ Generalized differences between Deciduous & Permanent teeth.
♦ Description of individual deciduous teeth, including their chronology of development, endodontic anatomy, differences between similar class of teeth & identification of individual teeth.

4. Occlusion :

♦ Definition, factors influencing occlusion - basal bone, arch, individual teeth, external & internal forces & sequence of eruption.
♦ Inclination of individual teeth - compensatory curves.
♦ Centric relation & Centric occlusion - protrusive, retrusive & lateral occlusion.
♦ Clinical significance of normal occlusion.
♦ Introduction to & Classification of Malocclusion.

II. ORAL EMBRYOLOGY

1. Brief review of development of face, jaws, lip, palate & tongue, with applied aspects.
2. Development of teeth :

- Epithelial mesenchymal interaction, detailed study of different stages of development of crown, root & supporting tissues of tooth & detailed study of formation of calcified tissues.
- Applied aspects of disorders in development of teeth.

3. Eruption of deciduous & Permanent teeth :

- Mechanisms in tooth eruption, different theories & histology of eruption, formation of dentogingival junction, role of gubernacular cord in eruption of permanent teeth.
- Clinical or Applied aspects of disorders of eruption.

4. Shedding of teeth :

- Factors & mechanisms of shedding of deciduous teeth.
- Complications of shedding.

III. ORAL HISTOLOGY

1. Detailed microscopic study of Enamel, Dentine, Cementum & Pulp tissue. Age changes & Applied aspects (Clinical and forensic significance) of histological considerations - Fluoride applications, transparent dentine, dentine hypersensitivity, reaction of pulp tissue to varying insults to exposed dentine ; Pulp calcifications & Hypercementosis.
2. Detailed microscopic study of Periodontal ligament & alveolar bone, age changes, histological changes in periodontal ligament & bone in normal & orthodontic tooth movement, applied aspects of alveolar bone resorption.
3. Detailed microscopic study of Oral Mucosa, variation in structure in relation to functional requirements, mechanisms of keratinization, clinical parts of gingiva, Dentogingival & Mucocutaneous junctions & lingual papillae. Age changes & clinical considerations.
4. Salivary Glands :

- Detailed microscopic study of acini & ductal system.
- Age changes& clinical considerations.

5. TM Joint :

- Review of basic anatomical aspects & microscopiuc study & clinical considerations.

6. Maxillary Sinus :

- Microscopic study, anatomical variations, functions & clinical relevance of maxillary sinus in dental practice.

7. Processing of Hard & soft tissues for microscopic study :

- Ground sections, decalcified sections & routine staining procedures.

8. Basic histochemical staining patterns of oral tissues.

IV. ORAL PHYSIOLOGY

1. Saliva :

- Composition of saliva - variations, formation of saliva & mechanisms of secretion, salivary reflexes, brief review of secretomotor pathway, functions, role of saliva in dental caries & applied aspects of hyper & hypo salivation.

2. Mastication :

- Masticatory force & its measurement - need for mastication, peculiarities of masticatory muscles, masticatory cycle, masticatory reflexes & neural control of mastication.

3. Deglutition :

- Review of the steps in deglutition, swallowing in infants, neural control of deglutition & dysphagia.

4. Calcium, Phosphorous & fluoride metabolism :

- Source, requirements, absorption, distribution, functions & excretion, clinical considerations, hypo & hypercalcemia & hyper & hypo phosphatemia & fluorosis.

5. Theories of Mineralization :

- Definition, mechanisms, theories & their drawbacks.
- Applied aspects of physiology of mineralization, pathological considerations - calculus formation.

6. Physiology of Taste :

- Innervation of taste buds & taste pathway, physiologic basis of taste sensation, age changes & applied aspects - taste disorders.

7. Physiology of Speech :

- Review of basic anatomy of larynx & vocal cords.
- Voice production, resonators, production of vowels & different consonants - Role of palate, teeth & tongue.
- Effects of dental prosthesis & appliances on speech & basic speech disorders.

RECOMMENDED TEXT BOOKS

1. Orban's Oral Histology & Embryology - S.N.Bhaskar
2. Oral Development & Histology - James & Avery
3. Wheeler's Dental Anatomy, Physiology & Occlusion - Major.M.Ash
4. Dental Anatomy - its relevance to dentistry - Woelfel & Scheid
5. Applied Physiology of the mouth - Lavelle
6. Physiology & Biochemistry of the mouth - Jenkins

4. GENERAL PATHOLOGY

AIM:
At the end of the course the student should be competent to:
Apply the scientific study of disease processes, which result in morphological and functional alterations in cells, tissues and organs to the study of pathology and the practice of dentistry.

OBJECTIVES:
Enabling the student

1. To demonstrate and apply basic facts, concepts and theories in the field of Pathology.
2. To recognize and analyze pathological changes at macroscopically and microscopical levels and explain their observations in terms of disease processes.
3. To Integrate knowledge from the basic sciences, clinical medicine and dentistry in the study of Pathology.
4. To demonstrate understanding of the capabilities and limitations of morphological Pathology in its contribution to medicine, dentistry and biological research.
5. To demonstrate ability to consult resource materials outside lectures, laboratory and tutorial classes.

COURSE CONTENT
A. General Pathology –

1. Introduction to Pathology
   Terminologies
   The cell in health
   The normal cell structure
   The cellular functions
2. Etiology and Pathogenesis of Disease
   Cell Injury
   Types – congenital
   Acquired
   Mainly Acquired causes of disease
   (Hypoxic injury, chemical injury, physical injury, immunological injury)
3. Degenerations
   Amyloidosis
   Fatty change
   Cloudy swelling
   Hyaline change, mucoid degeneration
4. Cell death & Necrosis
   Apoptasis
   Def, causes, features and types of necrosis
   Gangrene - Dry, wet, gas
   Pathological Calcifications
   (Dystrophic and metastatic)
5. Inflammation
   - Definition, causes types, and features
   - Acute inflammation
   a. The vascular response
   b. The cellular response
   c. Chemical mediators
   d. The inflammatory cells
   e. Fate
   - Chronic inflammation
   Granulomations inflammation
6. Healing
   - Regeneration
   - Repair
   a. Mechanisms
   b. Healing by primary intention
   c. Healing by secondary intention
   d. Fracture healing
   e. Factors influencing healing process
   f. Complications
7. Tuberculosis
   - Epidemiology
   - Pathogenesis (Formation of tubercle)
   - Pathological features of Primary and secondary TB
   - Complications and Fate
8. Syphilis
   - Epidemiology
   - Types and stages of syphilis

- Pathological features
- Diagnostic criterias
- Oral lesions

9. Typhoid
   - Epidemiology
   - Pathogenesis
   - Pathological features
   - Diagnostic criterias
10. Thrombosis
    - Definition, Pathophysiology
    - Formation, complications & Fate of a thrombus
11. Embolism
    - Definition
    - Types
    - Effects
12. Ischaemia and Infraction
    - Definition, etiology, types
    - Infraction of various organs
13. Derangements of body fluids
    - Oedema – pathogenesis
      Different types
14. Disorders of circulation
    - Hyperaemia
    - Shock
15. Nutritional Disorders
    - Common Vitamin Deficiencies
16. Immunological mechanisms in disease
    - Humoral & cellular immunity
    - Hypersensitivity & autommunity
17. AIDS and Hepatitis.
18. Hypertension
    - Definition, classification
    - Pathophysiology
    - Effects in various organs
19. Diabetes Mellitus
    - Def, Classification, Pathogenesis, Pathology in different organs
20. Adaptive disorders of growth
    - Atrophy & Hypertrophy, Hyperplasia, Metaplasia and Dysplasia
21. General Aspects of neoplesia
    a. Definition, terminology, classification
    b. Differences between benign and malignant neoplasms
    c. The neoplastic cell
    d. Metastasis
    e. Etiology and pathogenesis of neoplasia, Carcinogenesis
    f. Tumour biology
    g. Oncogenes and anti-oncogenes
    h. Diagnosis
    i. Precancerous lesions
    j. Common specific tumours, Sq papilloma & Ca, Basal cell Ca, Adenoma & Adenoca, Fibroma & Fibrosarcoma, Lipoma and liposarcoma

B. Systemic Pathology –

22 Anaemias
- Iron Deficiency anaemia, Megaloblastic anaemia

23.Leukaemias
- Acute and chronic leukaemias, Diagnosis and clinical features

24. Diseases of Lymph nodes
- Hodgkin's disease, Non Hodgkins lymphoma, Metastatic carcinoma

25. Diseases of oral cavity
- Lichen planus, Stomatitis, Leukoplakia, Sq cell Ca, Dental caries, Dentigerious cyst, Ameloblastoma

26. Diseases of salivary glands
- Normal structure, Sialadenitis, Tumours

27. Common diseases of Bones
- Osteomyelitis, Metabolic bone diseases, Bone Tumours, Osteosarcoma, Osteocalstoma, Giant cell Tumour, Ewing's sarcoma, Fibrous dysplasia, Aneurysmal bone cyst

28.Diseases of Cardiovascular system
- Cardiac failuare
- Congenital heart disease – ASD, VSD,PDA
  Fallot's Tetrology

- Infective Endocarditis
- Atherosclerosis
- Ischaemic heart Disease

29. Haemorrhagic Disorders
Coagulation cascade
Coagulation disorders
- Platelet funtion
- Platelet disorders

Practicals
1.Urine – Abnormal constitutients
- Sugar, albumin, ketone bodies

2. Urine – Abnormal consittuents
- Blood, bile salts, bile pigments

3. Haemoglobin (Hb) estimation
4. Total WBC count
5. Differential WBC Count
6. Packed cell volume(PCV,) rythrocyte sedimentation Rate (ESR)
7. Bleeding Time & clotting Time
8. Histopathology
Tissue Processing
Staining
9.Histopathology slides
- Acute appendicitis, Granulation tissue, fatty liver

10. Histopathology slides
CVC lung, CVC liver, Kidney amyloidosis
11. Histopathology slides
Tuberculosis, Actionomycosis, Rhinosporidiosis
12. Histopathology slides
Papilloma, Basal cell Ca, Sq cell Ca
13. Histopathology slides
Osteosarcoma, osteoclastoma, fibrosarcoma
14. Histopathology slides
Malignant melanoma, Ameloblastoma, Adenoma
15. Histopathology slides
Mixed parotid tumour, metastatic
carcinoma in lymph node

List of Textbooks

1. Robbins – Pathologic Basis of Disease Cotran, Kumar, Robbins
2. Anderson's Pathology Vol 1 & 2 Editors – Ivan Damjanov & James Linder
3. Wintrobe's clinical Haematolog Lee, Bithell, Foerster, Athens, Lukens

MICROBIOLOGY

AIM:

To introduce the students to the exciting world of microbes. To make the students aware of various branches of microbiology, importance, significance and contribution of each branch to mankind and other fields of medicine. The objectives of teaching microbiology can be achieved by various teaching techniques such as :

a) Lectures
b) Lecture Demonstrations
c) Practical exercises
d) Audio visual aids
e) Small group discussions with regular feed back from the students.

OBJECTIVES:

A. KNOWLEDGE AND UNDERSTANDING

At the end of the Microbiology course the student is expected to :

1. Understand the basics of various branches of microbiology and able to apply the knowledge relevantly.
2. Apply the knowledge gained in related medical subjects like General Medicine and General Surgery and Dental subjects like Oral Pathology, Community Dentistry, Periodontics, Oral Surgery, Pedodontics, Conservative Dentistry and Oral medicine in higher classes.
3. Understand and practice various methods of Sterilisation and disinfection in dental clinics.
4. Have a sound understanding of various infectious diseases and lesions in the oral cavity.

A. SKILLS

1. Student should have acquired the skill to diagnose, differentiate various oral lesions.
2. Should be able to select, collect and transport clinical specimens to the laboratory.
3. Should be able to carry out proper aseptic procedures in the dental clinic.

A brief syllabus of Microbiology is given as follows:

A. GENERAL MICROBIOLOGY:

1. History, Introduction, Scope, Aims and Objectives.
2. Morphology and Physiology of bacteria.
3. Detail account of Sterlisation and Disinfection.
4. Brief account of Culture media and Culture techniques.
5. Basic knowledge of selection, collection, transport, processing of clinical Specimens and identification of bacteria.
6. Bacterial Genetics and Drug Resistance in bacteria.

B. IMMUNOLOGY:

1. Infection - Definition, Classification, Source, Mode of transmission and types of Infectious disease.
2. Immunity
3. Structure and functions of Immune system
4. The Complement System
5. Antigen
6. Immunoglobulins - Antibodies - General structure and the role played in defense mechanism of the body.
7. Immune response
8. Antigen - Antibody reactions - with reference to clinical utility.
9. Immuno deficiency disorders - a brief knowledge of various types of immuno deficiency disorders - A sound knowledge of immuno deficiency disorders relevant to dentistry.
10. Hypersensitivity reactions
11. Autoimmune disorders - Basic knowledge of various types - sound knowledge of autoimmune disorders of oral cavity and related structures.
12. Immunology of Transplantation and Malignancy
13. Immunehaematology

C. SYSTEMATIC BACTERIOLOGY:

1. Pyogenic cocci - Staphylococcus, Streptococcus, Pneumococcus, Gonococcus, Meningococcus – brief account of each coccus - detailed account of mode of spread, laboratory diagnosis, Chemo therapy and prevention - Detailed account of Cariogenic Streptococci.
2. Corynebacterium diphtheriae - mode of spread, important clinical feature, Laboratory diagnosis, Chemotherapy and Active immunisation.
3. Mycobacteria - Tuberculosis and Leprosy
4. Clostridium - Gas gangrene, food poisoning and tetanus.
5. Non-sporing Anaerobes - in brief about classification and morphology, in detail about dental pathogens - mechanism of disease production and prevention.
6. Spirochaetes - Treponema pallidum - detailed account of Oral Lesions of syphilis, Borrelia vincentii.
7. Actinomycetes.

D. VIROLOGY:

1. Introduction
2. General properties, cultivation, host - virus interaction with special reference to Interferon.
3. Brief account of Laboratory diagnosis, Chemotherapy and immuno prophylaxis in general.
4. A few viruses of relevance to dentistry.

- Herpes Virus
- Hepatitis B Virus - brief about other types
- Human Immunodeficiency Virus (HIV)
- Mumps Virus
- Brief - Measles and Rubella Virus

5. Bacteriophage - structure and Significance

E. MYCOLOGY

1. Brief Introduction
2. Candidosis - in detail
3. Briefly on oral lesions of systemic mycoses.

F. PARASITOLOGY:

1. Brief introduction - protozoans and helminths
2. Brief knowledge about the mode of transmission and prevention of commonly seen parasitic infection in the region.

RECOMMENDED BOOKS FOR REGULAR READING:

1. Text book of Microbiology – R.Ananthanarayan & C.K.Jayaram Paniker.
2. Medical Microbiology – David Greenwood etal.

BOOKS FOR FURTHER READING/REFERENCE.

i) Microbiology – Prescott, etal.
ii) Microbiology – Bernard D. Davis , etal.
iii) Clinical & Pathogenic Microbiology – Barbara J Howard, etal.
iv) Mechanisms of Microbial diseases – Moselio Schaechter, etal.
v) Immunology an Introduction – Tizard
vi) Immunology 3rd edition – Evan Roitt , etal.

5. GENERAL AND DENTAL PHARMACOLOGY AND THERAPEUTICS

GOAL:

The broad goal of teaching under graduate students in pharmacology is to inculcate rational and scientific basis of therapeutics keeping in view of dental curriculum and Profession.

OBJECTIVES:

At the end of the course the student shall be able to:

i) Describe the pharmacokinetics and pharmacodynamics of essential and commonly used drugs in general and in dentistry in particular.
ii) List the indications, contraindications; interactions, and adverse reactions of commonly used drugs with reason.
iii) Tailor the use of appropriate drugs in disease with consideration to its cost, efficacy, safety for individual and mass therapy needs.
iv) Indicate special care in prescribing common and essential drugs in special medical situations such as pregnancy, lactation, old age, renal, hepatic damage and immuno compromised patients.
v) Integrate the rational drug therapy in clinical pharmacology.
vi) Indicate the principles underlying the concepts of "Essential drugs".

SKILLS:

At the end of the course the student shall be able to:

1) Prescribe drugs for common dental and medical ailments.
2) To appreciate adverse reactions and drug interactions of commonly used drugs.
3) Observe experiments designed for study of effects of drugs.
4) Critically evaluate drug formulations and be able to interpret the clinical pharmacology of marketed preparations commonly used in dentistry.

5) INTEGRATION: Practical knowledge of use of drugs in clinical practice will be acquired through integrated teaching with clinical departments.

LECTURE:

I. GENERAL PHARMACOLOGY:

1. General principles of pharmacology; sources and nature of drugs dosage forms; prescription writing; pharmacokinetics (absorption, distribution, metabolism and excretion of drugs), mode of action of drugs, combined effects of drugs, receptor mechanism of drug action, factors modifying drug response, adverse drug reactions; drug interactions, Implications of General Principles in clinical dentistry.
2. CNS drugs; General anaesthetics, hypnotics, analgescis psychotropic drugs, anti – epileptics, muscle relaxants, local anaesthetics, Implications of these drugs in clinical dentistry.
3. Autonomic drugs; sympathomimetics, antiadrenergic drugs parasympothomimetics and parasympatholytics, Implications of Autonomic drugs in clinical dentistry.
4. Cardiovascular drugs; Cardiac stimulants ; antihypertensive drugs, vasopressor agents, treatment of shock, Antianginal agents and diuretics, Implications of these drugs in clinical dentistry.
5. Autocoids:
   Histamine, antihistamines, prostaglandins, leukotriens and bronchodilators, Implications of Autocoids in clinical dentistry.
6. Drugs acting on blood : coagulants and anticoagulants, hematinics, Implications of these drugs in clinical dentistry.
7. G.I.T. Drugs, Purgatives, anti-diarrhoeal, antacids, anti-emetics, Implications of these drugs in clinical dentistry.
8. Endocrines; Emphasis on treatment of diabetes and glucocorticoids, thyroid and antithyroid agents, drugs affecting calcium balance and anabolic steroids, Implications of these drugs in clinical dentistry.
9. Chemotherapy: Antimicrobial agents (against bacteria, anaerobic infections, fungi, virus and broad spectrum). Infection management in dentistry. Phamacotherapy of Tuberculosis, leprosy and chemotherapy of malignancy in general. Implications of Chemotherpy in clinical dentistry.
10. Vitamins : Water soluble vitamins, Vit. D, Vit.K. and Vit. E, Implications of Vitamins in clinical dentistry.
11. Pharmacotherapy of emergencies in dental office and emergency drugs tray Implications of Pharmacotherapy in clinical dentistry.
12. Chealating agents – BAL,EDTA and desferrioxamine,

II. DENTAL PHARMACOLOGY

1. Anti - septics, astrigents, obtundents, mummifying agents, bleaching agents, styptics, disclosing agents, dentifrices, mouth washes, caries and fluorides.
2. Pharmacotherapy of common oral conditions in dentistry.
   Practicals and Demonstrations :
   To familiarise the student with the methodology: prescription writing and dispensing. Rationale of drug combinations of marketed drugs.

LIST OF BOOKS RECOMMENDED FOR READING AND REFERENCE

1. R.S.Satoskar, Kale Bhandarkar's Pharmacology and Pharmacolherapentics, 10th Edition, Bombay Popular Prakashan 1991.
2. Bertam G Katzung, Basic and Clinical pharmacology 6th ed. Appleton & Lange 1997.
3. Lauerence D.R. Clinical Pharmacology 8th ed. Churchill Livingstone 1997.
4. Satoskar R.S. & Bhandarkar S.D., Pharmacology and Pharmacotherapeutics part I & part ii, 13th Popular Prakashan Bombay 1993.
5. Tripathi K.D., Essentials of Medical Pharmacology 4th ed Jaypee Brothers 1999.

6. DENTAL MATERIALS

The science of Dental Material has undergone tremendous changes over the years. Continued research has led to new material systems and changing concepts in the dental field. Interlinked with various specialised branches of chemistry, practically all engineering applied sciences and biological characteristics, the science of dental material emerged as a basic sciences in itself with its own values and principles.

INTRODUCTION

AIMS:

Aim of the course is to present basic chemical and physical properties of Dental materials as they are related to its manipulation to give a sound educational background so that the practice of the dentistry emerged from art to empirical status of science as more information through further research becomes available. It is also the aim of the course of Dental materials to provide with certain criteria of selection and which will enable to discriminate between facts and propaganda with regards to claims of manufactures.

OBJECTIVES:

To understand the evolution and development of science of dental material.

To explain purpose of course in dental materials to personnels concerned with the profession of the dentistry. Knowledge of physical and chemical properties. Knowledge of biomechanical requirements of particular restorative procedure. An intelligent compromise of the conflicting as well as co-ordinating factors into the desired Ernest. Laying down standards or specifications of various materials to guide to manufacturers as well as to help professionals.

Search for newer and better materials which may answer our requirements with greater satisfaction. To understand and evaluate the claims made by manufactures of dental materials

NEEDS FOR THE COURSE:

The profession has to rise from an art to a science, , the need for the dentist to possess adequate knowledge of materials to exercises his best through knowledge of properties of different types of materials. The growing concern of health hazards due to mercury toxicity, inhalation of certain vapour or dust materials, irritations and allergic reaction to skin due to contact of materials. Materials causing irritation of oral tissues, pH of restorative materials causing inflammation and necrosis of pulp which is a cause for the dentist to posses wider knowledge of physical, chemical and biological properties of materials being used. For the protection for the patient and his own protection certain criteria of selection are provided that will enable the dentist to discriminate between facts and propaganda, which will make a material biologically accept.

SCOPE:

The dental materials is employed in mechanical procedures including restorative dentistry such as Prosthodontics, endodontics, periodontal, orthodontics and restorative materials. There is scarcely a dental procedure that does not make use of dental materials in one form or another and therefore the application of dental material is not limited to any one branch of dentistry. Branches such as minor surgery and periodontics require less use of materials but the physical and chemical characters of materials are important in these fields.

The toxic and tissue reaction of dental materials and their durability in the oral cavity where the temperature is between 32 & 37 degree centigrade, and the ingestion of hot or cold food ranges from 0-70 degree centigrade. The acid an alkalinity of fluids shown pH varies from 4 to 8.5. The load on 1 sq. mm of tooth or restorative materials can reach to a level as high as many kilograms. Thus the biological properties of dental materials cannot be separated from their physical and chemical properties.

2). STRUCTURE OF MATTER AND PRINCIPLES OF ADHESION.

Change of state, inter atomic primary bonds, inter atomic secondary bonds, inter atomic bond distance and bonding energy, thermal energy, crystalline structure, non crystalline structures, diffusion, adhesion and bonding and adhesion to tooth structures.

3). IMPORTANT PHYSICAL PROPERTIES APPLICABLE TO DENTAL MATERIALS

Physical properties are based on laws of mechanics, acoustics, optics, thermodynamics, electricity, magnetism, radiation, atomic structure or nuclear phenomena. Hue, value, chroma and translucency physical properties based on laws of optics, dealing with phenomena of light, vision and sight. Thermal conductivity & coefficient of thermal expansion are physical properties based on laws of thermodynamics. Stress, strain, proportional limit, elastic limit yield strength, modulus of elasticity, flexibility, resilience, impact, impact strength, permanent deformation, strength, flexure strength fatigue, static fatigue, toughness, brittleness, ductility & malleability, hardness, abrasion resistance, relaxation, rheology, Thixotropic, creep, static creep, dynamic creep, flow, colour, three dimensional colour – hue, values, chroma, Munsell system, metamersim, fluorescence, physical properties of tooth, stress during mastication

4). BIOLOGICAL CONSIDERATIONS IN USE OF DENTAL MATERIALS.

Materials used are with the knowledge of appreciation of certain biological considerations for use in oral cavity. Requirement of materials with biological compatibility. Classification of materials from perspective of biological compatibility. eg. contact with soft tissues, affecting vitality of pulp, used for root canal fillings, affecting hard tissues of teeth, laboratory materials that could be accidentally be inhaled or ingested during handling. Hazards associated with materials: pH-effecting pulp, polymers causing chemical irritation, mercury toxicity, etc. Microleakage, Thermal changes, Galvanism, toxic effect of materials. Biological evaluation for systemic toxicity, skin irritation, mutagenecity and carcinogenicity. Disinfection of dental materials for infection control.

5). GYPSUM & GYPSUM PRODUCTS.

Gypsum – its origin, chemical formula, Products manufactured from gypsum.
Dental plaster, Dental stone, Die stone, high strength, high expansion stone.
Application and manufacturing procedure of each, macroscopic and microscopic structure of each .
Supplied as and Commercial names.
Chemistry of setting, setting reaction, theories of setting, gauging water, Microscopic structure of set material.
Setting time: working time and setting time, Measurement of setting time and factors controlling setting time .
Setting expansion, Hygroscopic setting expansion – factors affecting each
Strength :wet strength, dry strength, factors affecting strength, tensile strength
Slurry – need and use.
Care of cast.
ADA classification of gypsum products
Description of impression plaster and dental investment
Manipulation including recent methods or advanced methods.
Disinfection : infection control, liquids, sprays, radiation
Method of use of disinfectants
Storage of material – shelf life

6) IMPRESSION MATERIALS USED IN DENTISTRY

Impression plaster, Impression compound, Zinc oxide eugenol impression paste & bite registration paste incl., non eugenol paste, Hydrocolloids, reversible and irreversible, Elastomeric impression materials. Polysulphide, Condensation silicones, Addition silicones, Polyether, Visible light cure polyether urethane dimethacrylate, Historical background & development of each impression material,
Definition of impression , Purpose of making impression, Ideal properties required and application of material, Classification as per ADA specification, general & individual impression material.
Application and their uses in different disciplines, Marketed as and their commercial names, Mode of supply & mode of application bulk/wash impression. Composition, chemistry of setting ,Control of setting time , Type of impression trays required, Adhesion to tray, manipulation, instruments & equipments required. Techniques of impression, storage of impression, (Compatibility with cast and die material). Any recent advancements in material and mixing devices. Study of properties: Working time, setting time, flow, accuracy, strength, flexibility, tear strength, dimensional stability, compatibility with cast & die materials incl., electroplating Biological properties: tissue reaction , Shelf life & storage of material, Infection control – disinfection, Advantages & disadvantages of each material.

7). SYNTHETIC RESINS USED IN DENTISTRY.

Historical background and development of material, Denture base materials and their classification and requirement
Classification of resins
Dental resins – requirements of dental resins, applications, polymerisation, polymerisation mechanism stages in addition polymerisation, inhibition of polymerisation, co polymerization, molecular weight, crosslinking, plastixizers, Physical properties of polymers, polymer structures types of resins.
ACRYLIC RESINS:
Mode of polymerisation: Heat activated, Chemically activated, Light activated, Mode of supply, application, composition, polymerisation reaction of each. Technical considerations: Methods of manipulation for each type of resin. Physical properties of denture base resin. Miscellaneous resins & techniques: Repair resins, Relining and rebasing. Short term and long-term soft-liners, temporary crown

and bridge resins, Resin impression trays, Tray materials, Resin teeth, materials in maxillofacial prosthesis, Denture cleansers, Infection control in detail, Biological properties and allergic reactions.

RESTORATIVE RESINS:
Historical background, Resin based restorative materials, Unfilled & filled, Composite restorative materials, Mode of supply, Composition, Polymerisation mechanisms: Chemically activated, Light activated, Dual cure: Degree of conversion, Polymerisation shrinkage Classification of Composites: Application, composition and properties of each Composites of posterior teeth, Prosthodontics resins for veneering. Biocompatibility – microleakage, pulpal reaction, pulpal protection Manipulation of composites: Techniques of insertion of Chemically activated, light activated, dual cure Polymerisation, Finishing and polishing of restoration, Repair of composites Direct bonding Bonding: Need for bonding, Acid - etch technique, Enamel bonding, Dentin bonding agents. Mode of bonding, Bond strength, Sandwich technique its indication and procedure. Extended application for composites: Resins for restoring eroded teeth, Pit and fissure sealing, Resin inlays system – Indirect & direct, Core build up, Orthodontic applications.

8). METAL AND ALLOYS:
Structure and behaviour of metals, Solidification of metals, mechanism of crystallisation amorphous & crystalline. Classification of alloys, Solid solutions, Constitutes or equilibrium phase diagrams:Electric alloys, Physical properties, Peritectic alloys, Solid state reaction other binary systems: Metallography & Heat treatment. Tarnish and corrosion. Definition: causes of corrosion, protection against corrosion., Corrosion of dental restorations, clinical significance of galvanic current. Dental Amalgam.

History:
Definition of dental amalgam, application, Alloy classification, manufacture of alloy powder composition - available as.
Amalgamation : setting reaction & resulting structure , properties , Microleakage
Dimensional stability, Strength, Creep, Clinical performance
Manipulation: Selection of alloy, proportioning, mechanism of trituration, condensation, carving & finishing. Effect of dimensional changes, Marginal deterioration., Repair of amalgam, mercury toxicity, mercury hygiene.

DIRECT FILLING GOLD:
Properties of pure gold, mode of adhesion of gold for restoration forms of direct filling gold for using as restorative material
Classification : Gold Foil, Electrolytic precipitate, powdered gold.
Manipulation: Removal of surface impurities and compaction of direct filling gold.
Physical properties of compacted gold, Clinical performance.

<u>DENTAL CASTING ALLOYS:</u>
Historical background, desirable properties of casting alloys.
Alternatives to cast metal technology: direct filling gold, amalgam, mercury free condensable intermetallic compound - an alternative to metal casting process. CAD-CAM process for metal & ceramic inlays - without need of impression of teeth or casting procedure, pure titanium, most bio compatible metal which are difficult to cast can be made into crowns with the aid of CAD- CAM technology . Another method of making copings - by copy milling (without casting procedures).
Classification of casting alloys: By function & description.
Recent classification , High noble (HN), Noble (N) and predominantly base metal (PB)
Alloys for crown & bridge, metal ceramic & removable partial denture. Composition, function, constituents and application, each alloy both noble and base metal. Properties of alloys: Melting range, mechanical properties, hardness, elongation, modulus of elasticity, tarnish and corrosion.
Casting shrinkage and compensation of casting shrinkage. Biocompatability - Handling hazards & precautions of base metal alloys, casting investments used. Heat treatment : Softening & hardening heat treatment. Recycling of metals. Titanium alloys & their application , properties & advantages. Technical considerations In casting . Heat source, furnaces.

9). DENTAL WAXES INCLUDING INLAY CASTING WAX
Introduction and importance of waxes. Sources of natural waxes and their chemical nature.
Classification of Waxes:
Properties: melting range, thermal expansion, mechanical properties, flow & residual stresses, ductility. Dental Wax: Inlay wax: Mode of supply : Classification & composition, Ideal requirements: Properties of inlay wax: Flow, thermal properties Wax distortion & its causes.
Manipulation of inlay wax: Instruments & equipment required, including electrically heated instruments metal tips and thermostatically controlled wax baths.
Other waxes: Applications, mode of supply & properties.
Casting Wax, Base plate wax, Processing wax, Boxing wax, Utility wax, Sticky wax, Impression wax for corrective impressions, Bite registration wax.

10). DENTAL CASTING INVESTMENTS.
Definition, requirements, classification
Gypsum bonded - classification. Phosphate bonded, Silica bonded
Mode of Supply: Composition, application , setting mechanism, setting time & factors controlling.

Expansions :Setting expansion, Hygroscopic Setting expansion, & thermal expansion : factors affecting. Properties : Strength, porosity, and fineness & storage. Technical considerations: For Casting procedure, Preparation of die, Wax pattern, spruing, investing, control of shrinkage compensation, wax burnout, and heating the invested ring, casting. Casting machines, source of heat for melting the alloy. Defects in casting.

11). SOLDERING, BRAZING AND WELDING

Need of joining dental appliances, Terms & Definition

Solders: Definition, ideal requirement, types of solders – Soft & hard and their fusion temperature, application. Mode of supply of solders, Composition and selection, Properties. Tarnish & corrosion resistance mechanical properties, microstructure of soldered joint. Fluxes & Anti fluxes: Definition, Function, Types, commonly used fluxes & their selection Technique of Soldering & Brazing : free hand soldering and investment, steps and procedure. Welding,: Definition, application, requirements, procedure, weld decay - causes and how to avoid it. Laser welding.

WROUGHT BASE METAL ALLOYS

Applications and different alloys used mainly for orthodontics purpose

1. Stainless steel
2. Cobalt chromium nickel
3. Nickel titanium
4. Beta titanium

Properties required for orthodontic wires, working range, springiness, stiffness, resilience, Formability, ductility, ease of joining, corrosion resistance, stability in oral environment, bio compatibility

Stainless steels: Description, type, composition & properties of each type. Sensitisation & stabilisation , Mechanical properties – strength, tensile, yield strength, KHN. Braided & twisted wires their need , Solders for stainless steel, Fluxes, Welding

1. Wrought cobalt chromium nickel alloys, composition, allocation, properties, heat treatment, physical properties
2. Nickel – Titanium alloys, shape, memory & super elastic
3. Titanium alloys, application, composition, properties, welding, Corrosion resistance

12). DENTAL CEMENTS

Definition & Ideal requirements:

Cements: Silicate, Glass ionomer, metal modified glass ionomer, resin modified glass ionomer, zinc oxide eugenol, modified zinc oxide eugenol, zinc phosphate, zinc silico phosphate, zinc poly carboxylate, Cavity liners and cement bases, Varnishes Calcium hydroxide, Gutta percha

Application, classification (general and individual), setting mechanism, mode of supply, Properties, factors affecting setting, special emphasis on critical procedures of manipulation and protection of cement, mode of adhesion, biomechansim of caries inhibition.

Agents for pulpal protection., Modifications and recent advances, Principles of cementation. Special emphasis on cavity liners and cement bases and luting agents.

13). DENTAL CERAMICS

Historical background & General applications.

Dental ceramics : definition, classification, application, mode of supply, manufacturing procedure, methods of strengthening. Properties of fused ceramic: Strength and factors affecting, modulus of elasticity, surface hardness, wear resistance, thermal properties, specific gravity, chemical stability, esthetic properties, biocompatability, technical considerations.

Metal Ceramics (PFM): Alloys - Types and composition of alloys. Ceramic - Type and Composition.

Metal Ceramic Bond - Nature of bond. Bonding using electro deposition, foil copings, bonded platinum foil, swaged gold alloy foil coping. Technical considerations for porcelain and porcelain fused metal restorations. Recent advances - all porcelain restorations, Manganese core, injection moulded, castable ceramics, glass infiltrated alumina core ceramic (In ceram), ceramic veners, inlays and onlays, and CAD - CAM ceramic. Chemical attack of ceramic by fluoride. Porcelain furnaces.

14). ABRASION & POLISHING AGENTS

Definition of abrasion and polishing. Need of abrasion and polishing. Types of abrasives: Finishing, polishing & cleaning. Types of abrasives: Diamond, Emery, aluminium oxides garnet, pumice, Kieselgurh, tripoli, rouge, tin oxide, chalk, chromic oxide, sand, carbides, diamond, zirconium silicate Zinc oxide

<u>ABRASIVE ACTION :</u>

Desirable characteristics of an abrasive, Rate of abrasion, Size of particle, pressure and speed.

Grading of abrasive & polishing agents. Binder, Polishing materials & procedures used. Technical consideration - Material and procedure used for abrasion and polishin Electrolytic polishing and burnishing.

15). DIE AND COUNTER DIE MATERIALS INCLUDING ELECTROFORMING AND ELECTROPOLISHING.

Types – Gypsum products, Electroforming, Epoxy resin, Amalgam.

16). DENTAL IMPLANTS : Evolution of dental implants, types and materials.
17). MECHANICS OF CUTTING : Burs and points.

At the end of the course the student should have the knowledge about the composition, properties, manipulative techniques and their various commercial names. The student should also acquire skills to select and use the materials appropriately for laboratory and clinical use.

RECOMMENDED BOOKS:

1. Phillips Science of Dental Materials – 10th edn.- Kenneth J. Anusavice
2. Restorative Dental Materials – 10 edn. Robert G.Craig
3. Notes on Dental Materials – E.C. Combe

7. PRE CLINICAL CONSERVATIVE DENTISTRY LABORATORY EXERCISES

1. Identification and study of handcutting instruments chisles, gingival margin trimmers, excavators and hatchet.
2. Identification and use of rotary cutting instruments in contra angle hand pieces burs (Micromotor)
3. Preparation class I and extended class I and class II and MOD's and class V amounting to 10 exercises in plaster models.
4. 10 exercises in mounted extracted teeth of following class I, 4 in number class I extended cavities 2, class II 4 in number and Class V 2 in number. Cavity preparation base application matrix and wedge placement restoration with amalgam.
5. Exercises on phantom head models which includes cavity preparation base and varnish application matrix and wedge placement followed by amalgam restoration.

Class I	5
Class I with extension	2
Class II	10
Class II Mods	2
Class V and III forglass ionmers	4
Class V for amalgam	2

6. Polishing of above restorations.
7. Demonstration of Class III and Class V cavity preparation. For composites on extracted tooth completing the restoration.
8. Polishing and finishing of the restoration of composites.
9. Identification and manipulation of varnish bases like Zinc Phosphate, Poly carboxylate, Glass Ionomers, Zinc Oxide, Euginol cements.
10. Identification and manipulation of various matrices, tooth separators and materials like composites and modified glassionomer cements.
11. Cast Restoration
    1. Preparation of Class II inlay cavity
    2. Fabrication of wax pattern
    3. Sprue for inner attachment investing
    4. Investing of wax pattern
    5. Finishing and cementing of class II inlay in extracted tooth.
12. Endodontics
    1. Identification of basic endodontic instruments
    2. Cornal access cavity preparation on extracted. Upper central incisiors
    3. Determination of working length.
    4. Biomechanical preparation of root canal space of central incisor
    5. Obfuration of root canal spaces. Absens of cornal access cavity.
    6. Closure of acess cavity

8. ORAL PATHOLOGY & ORAL MICROBIOLOGY

OBJECTIVES:

At the end of Oral Pathology & Oral Microbiology course, the student should be able to comprehend -

1. The different types of pathological processes, that involve the oral cavity.
2. The manifestations of common diseases, their diagnosis & correlation with clinical pathological processes.
3. An understanding of the oral manifestations of systemic diseases should help in correlating with the systemic physical signs & laboratory findings.
4. The student should understand the underlying biological principles governing treatment of oral diseases.
5. The principles of certain basic aspects of Forensic Odontology.

SKILLS:

1. Microscopic study of common lesions affecting oral tissues through microscopic slides & projection slides.
2. Study of the disease process by surgical specimens.
3. Study of teeth anomalies/polymorphisms through tooth specimens & plaster casts.
4. Microscopic study of plaque pathogens.
5. Study of haematological preparations (blood films) of anaemias & leukemias.

6. Basic exercises in Forensic Odontology such as histological methods of age estimation and appearance of teeth in injuries.

1. INTRODUCTION:

♦ A bird's eye view of the different pathological processes involving the oral cavity & oral cavity involvement in systemic diseases to be brought out. Interrelationship between General Medicine & General Surgery & Oral pathology to be emphasized.

2. Developmental disturbances of teeth, jaws and soft tissues of oral & paraoral region :

♦ Introduction to developmental disturbances - Hereditary, Familial mutation, Hormonal etc. causes to be highlighted.

♦ Developmental disturbances of teeth - Etiopathogenesis, clinical features, radiological features & histopathological features as appropriate :-
The size, shape, number, structure & eruption of teeth & clinical significance of the anomalies to be emphasized.

♦ Forensic Odontology.

♦ Developmental disturbances of jaws - size & shape of the jaws.

♦ Developmental disturbances of oral & paraoral soft tissues - lip & palate - clefts, tongue, gingiva, mouth, salivary glands & face.

3. Dental Caries :

♦ Etiopathogenesis, microbiology, clinical features, diagnosis, histopathology, immunology, prevention of dental caries & its sequelae.

4. Pulp & Periapical Pathology & Osteomyelitis.

♦ Etiopathogenesis & interrelationship, clinical features, microbiology, histopathology & radiological features (as appropriate) of pulp & periapical lesions & osteomyelitis.

♦ Sequelae of periapical abscess - summary of space infections, systemic complications & significance.

5. Periodontal Diseases :

♦ Etiopathogenesis, microbiology, clinical features, histopathology & radiological features (as appropriate) of gingivitis, gingival enlargements & periodontitis. Basic immunological mechanisms of periodontal disease to be highlighted.

6. Microbial infections of oral soft tissues :

♦ Microbiology, defence mechanisms including immunological aspects, oral manifestations, histopathogy and laboratory diagnosis of common bacterial, viral & fungal infections namely :-
Bacterial : Tuberculosis, Syphilis, ANUG & its complications - Cancrum Oris.
Viral : Herpes Simplex, Varicella zoster, Measles, Mumps & HIV infection.
Fungal : Candidal infection. Apthous Ulcers.

7. Common non- inflammatory diseases involving the jaws :

♦ Etiopathogenesis, clinical features, radiological & laboratory values in diagnosis of :
Fibrous dysplasia, Cherubism, Osteogenesis Imperfecta, Paget's disease, Cleidocranial dysplasia, Rickets, Achondroplasia, Marfan's syndrome & Down's syndrome.

8. Diseases of TM Joint :

♦ Ankylosis, summary of different types of arthritis & other developmental malformations, traumatic injuries & myofascial pain dysfunction syndrome.

9. Cysts of the Oral & Paraoral region :

♦ Classification, etiopathogenesis, clinical features, histopathology, laboratory & radiological features (as appropriate) of Odontogenic cysts, Non-Odontogenic cysts, Pseudocysts of jaws & soft tissue cysts of oral & paraoral region.

10. Tumours of the Oral Cavity :

♦ Classification of Odontogenic, Non-Odontogenic & Salivary Gland Tumours. Etiopathogenesis, clinical features, histopathology, radiological features & laboratory diagnosis (as appropriate) of the following common tumours :-

a) Odontogenic - all lesions.

b) Non-odontogenic

- Benign Epithelial - Papilloma, Keratoacanthoma & Naevi.
- Benign Mesenchymal - Fibroma, Aggressive fibrous lesions, Lipoma, Haemangioma,Lymphangioma, Neurofibroma, Schwannoma, Chondroma, Osteoma & Tori.
- Malignant Epithelial - Basal Cell Carcinoma, Verrucous Carcinoma, Squamous Cell carcinoma & Malignant Melanoma.
- Malignant Mesenchymal - Fibrosarcoma, Osteosarcoma, Giant cell tumour, Chondrosarcoma, Angiosarcoma, Kaposi's sarcoma, Lymphomas , Ewing's sarcoma & Other Reticuloendothelial tumours.

c) Salivary Gland

- Benign Epithelial neoplasms - Pleomorphic Adenoma, Warthin's tumour, & Oncocytoma.
- Malignant Epithelial neoplasms - Adenoid Cystic Carcinoma, Mucoepidermoid Carcinoma, Acinic Cell Carcinoma & Adenocarcinomas.

d) Tumours of Disputed Origin - Congenital Epulis & Granular Cell Myoblastoma.
e) Metastatic tumours - Tumors metastasizing to & from oral cavity & the routes of metastasis.

11. Traumatic, Reactive & Regressive lesions of Oral Cavity :
- Pyogenic & Giant cell granuloma, exostoses Fibrous Hyperplasia, Traumatic Ulcer & Traumatic Neuroma.
- Attrition, Abrasion, Erosion, Bruxism, Hypercementosis, Dentinal changes, Pulp calcifications & Resorption of teeth.
- Radiation effects of oral cavity, summary of Physical & Chemical injuries including allergic reactions of the oral cavity.
- Healing of Oral wounds & complications - Dry socket.

12. Non neoplastic Salivary Gland Diseases :
- Sialolithiasis, Sialosis, Sialadenitis, Xerostomia & Ptyalism.

13. Systemic Diseases involving Oral cavity :
- Brief review & oral manifestations, diagnosis & significance of common Blood, Nutritional, Hormonal & Metabolic diseases of Oral cavity.

14. Mucocutaneous Lesions :
- Etiopathogenesis, clinical features & histopathology of the following common lesions.
  Lichen Planus, Lupus Erythematosus, Pemphigus & Pemphigoid lesions, Erythema Multiforme, Psoriasis, Scleroderma, Ectodermal Dysplasia, Epidermolysis bullosa & White sponge nevus..

15. Diseases of the Nerves :
- Facial neuralgias - Trigeminal & Glossopharyngeal. VII nerve paralysis, Causalgia.
- Psychogenic facial pain & Burning mouth syndrome.

16. Pigmentation of Oral & Paraoral region & Discolouration of teeth :
- causes & clinical manifestations.

17. Diseases of Maxillary Sinus :
- Traumatic injuries to sinus, Sinusitis, Cysts & Tumours involving antrum.

18. a) ORAL PRECANCER – CANCER; Epidemiology, aetiology, clinical and histopatholotgical features, TNM classification. Recent advances in diagnosis, management and prevention.
    b) Biopsy : Types of biopsy, value of biopsy, cytology, histo chemistry & frozen sections in diagnosis of oral diseases.

19. Principles of Basic Forensic Odontology (Pre-clinical Forensic Odontology):
- Introduction, definition, aims & scope.
- Sex and ethnic (racial) differences in tooth morphology and histological age estimation
- Determination of sex & blood groups from buccal mucosa / saliva.
- Dental DNA methods
- Bite marks, rugae patterns & lip prints.
- Dental importance of poisons and corrosives.
- Overview of forensic medicine and toxicology

RECOMMENDED BOOKS

1. A Text Book of Oral Pathology - Shafer, Hine & Levy.
2. Oral Pathology - Clinical Pathologic correlations - Regezi & Sciubba.
3. Oral Pathology - Soames & Southam.
4. Oral Pathology in the Tropics - Prabhu,Wilson,Johnson & Daftary

9. GENERAL MEDICINE

GUIDELINES:

Special emphasis should be given throughout on the importance of various diseases as applicable to dentistry.

1. Special precautions/ contraindication of anaesthesia and various dental procedures in different systemic diseases.
2. Oral manifestations of systemic diseases.
3. Medical emergencies in dental practice.

A dental student should be taught in such a manner he/she is able to record the arterial pulse, blood pressure and be capable of suspecting by sight and superficial examination of the body – diseases of the heart, lungs, kidneys, blood etc. He should be capable of handling medical emergencies encountered in dental practice.

THEORY SYLLABUS

CORE TOPICS (Must Know)	COLLATERAL TOPICS (Desirable to Know)
1. Aims of medicine Definitions of signs, symptoms, diagnosis, differential diagnosis treatment & prognosis.	
2. Infections. Enteric fever, AIDS, herpes simplex, herpes zoster, syphilis diphtheria.	Infectious mononucleosis mumps, measles, rubella, malaria.

3. G.I.T. Stomatitis, gingival hyperplasia, dysphagia, acid peptic disease, jaundice, acute and chronic hepatitis, cirrhosis of liver ascites.	Diarrhea Dysentery Amoebiasis Malabsorhtion
4. CVS Acute rheumatic fever rheumatic valvular heart disease, hypertension, ischemic heart disease, infective endocarditis, common arrhythmias, congenital heart disease, congestive cardiac failure.	
5. RS Pneumonia, COPD, Pulmonary TB, Bronehial asthma	Lung Abscess Pleural effusion Pneumothorax Bronchiectasis Lung cancers.
6. Hematology Anemias, bleeding & clotting disorders, leukemias, lymphomas, agranulocytosis, splenomegaly, oral manifestations of hematologic disorders, generalized Lymphadenopathy.	
7. Renal System Acute nephritis Nephrotic syndrome	Renal failure
8, Nutrition Avitaminosis	Balanced diet PEM Avitaminosis
9. CNS Facial palsy, facial pain including trigeminal neuralgia, epilepsy, headache including migraine.	- Meningitis - Examination of comatose patient - Examination of cranial nerves.
10. Endocrines Diabetes Mellitus Acromegaly, Hypothyroidism, Thyrotoxicosis, Calcium metabolism and parathyroids.	Addison's disease, Cushing's syndrome.
11. Critical care Syncope, cardiac arrest, CPR, shock	Ac LVF ARDS

CLINICAL TRAINING:
The student must be able to take history, do general physical examination (including build, nourishment, pulse, BP, respiration, clubbing, cyanosis, jaundice, lymphadenopathy, oral cavity) and be able to examine CVS, RS and abdomen and facial nerve.

10. GENERAL SURGERY

AIMS:
To acquaint the student with various diseases, which may require surgical expertise and to train the student to analyze the history and be able to do a thorough physical examination of the patient. The diseases as related to head and neck region are to be given due importance, at the same time other relevant surgical problems are also to be addressed. At the end of one year of study the student should have a good theoretical knowledge of various ailments, and be practically trained to differentiate benign and malignant diseases and be able to decide which patient requires further evaluation.

1. HISTORY OF SURGERY:
   The development of surgery as a speciality over the years, will give the students an opportunity to know the contributions made by various scientists, teachers and investigators. It will also enable the student to understand the relations of various specialities in the practice of modern surgery.
2. GENERAL PRINCIPLES OF SURGERY:
   Introduction to various aspects of surgical principles as related to orodental diseases. Classification of diseases in general. This will help the student to understand the various diseases, their relevance to routine dental practice.
3. WOUNDS:
   Their classification, wound healing, repair, treatment of wounds, medico-legal aspects of accidental wounds and complications of wounds.
4. INFLAMMATION:
   Of soft and hard tissues. Causes of inflammation, varieties, treatment and sequelae.
5. INFECTIONS:
   Acute and chronic abscess skin infections, cellulitis, carbuncle, and erysepelas. Specific infections such as tetanus, gangrene, syphilis, gonorrhoea, tuberculosis, Actinomycosis, Vincents angina, cancrum oris. Pyaemia, toxaemia and septicaemia.
6. TRNSMISSABLE VIRAL INFECTIONS:

HIV and Hepatitis B with special reference to their prevention and precautions to be taken in treating patients in a carrier state.

7. SHOCK AND HAEMORRHAGE:
Classification, causes, clinical features and management of various types of shock. Syncope, Circulatory collapse. Haemorrhage – different types, causes, clinical features and management. Blood groups, blood transfusion, precautions and complications of blood and their products. Hemophilia's, their transmission, clinical features and management especially in relation to minor dental procedures.

8. TUMOURS, ULCERS, CYSTS, SINUS AND FISTULAE:
Classification, clinical examination and treatment principles in various types of benign and malignant tumours, ulcers, cysts, sinus and fistulae.

9. DISEASES OF LYMPHATIC SYSTEM:
Especially those occurring in head and neck region. Special emphasis on identifying diseases such as tubercular infection, lymphomas, leukaemias, metastatic lymph node diseases.

10. DISEASES OF THE ORAL CAVITY:
Infective and malignant diseases of the oral cavity and oropharynx including salivary glands with special emphasis on preventive aspects of premalignant and malignant diseases of the oral cavity.

11. DISEASES OF LARYNX, NASOPHARYNX:
Infections and tumours affecting these sites. Indications, procedure and complications of tracheostmy.

12. NERVOUS SYSTEM:
Surgical problems associated with nervous system with special reference to the principles of peripheral nerve injuries, their regeneration and principles of treatment. Detailed description of afflictions of facial nerve and its management. Trigeminal neuralgia, its presentation and treatment.

13. FRACTURES:
General principles of fractures, clinical presentation and treatment with additional reference to newer methods of fracture treatment. Special emphasis on fracture healing and rehabilitation.

14. PRINCIPLES OF OPERATIVE SURGERY:
Principles as applicable to minor surgical procedures including detailed description of asepsis, antiseptics, sterilisation, principles of anaesthesia and principles of tissue replacement. Knowledge of sutures, drains, diathermy, cryosurgery and use of Laser in surgery.

15. ANOMOLIES OF DEVELOPMENT OF FACE:
Surgical anatomy and development of face. Cleft lip and cleft palate—principles of management.

16. DISEASES OF THYROID AND PARATHYROID:
Surgical anatomy, pathogenesis, clinical features and management of dysfunction of thyroid and parathyroid glands. Malignant diseases of the thyroid—classification, clinical features and management.

17. SWELLINGS OF THE JAW:
Differential diagnosis and management of different types of swellings of the jaw.

18. BIOPSY:
Different types of biopsies routinely used in surgical practice.
Skills to be developed by the end of teaching is to examine a routine swelling, ulcer and other related diseases and to perform minor surgical procedures such as draining an abscess, taking a biopsy etc.

11. CONSERVATIVE DENTISTRY AND ENDODONTICS

OBJECTIVES:

A. Knowledge and understanding
B. Skills and
C. Attitudes

A). Knowledge and under standing:

The graduate should acquire the following knowledge during the period of training.

i. To diagnose and treat simple restorative work for teeth.
ii. To gain knowledge about aesthetic restorative material and to translate the same to patients needs.
iii. To gain the knowledge about endodontic treatment on the basis of scientific foundation.
iv. To carry out simple endodontic treatment.
v. To carry out simple luexation of tooth and its treatment and to provide emergency endodontic treatment.

SKILLS:

He should attain following skills necessary for practice of dentistry

i) To use medium and high speed hand pieces to carry out restorative work.
ii) Poses the skills to use and familiarise endodontic instruments and materials needed for carrying out simple endodontic treatment.
iii) To achieve the skills to translate patients esthetic needs along with function.

ATTITUDES:

i). Maintain a high standard of professional ethics and conduct and apply these in all aspects of professional life.
ii). Willingness to participate in CDE programme to update the knowledge and professional skill from time to time.
iii). To help and participate in the implementation of the national oral health policy.
iv). He should be able to motivate the patient for proper dental treatment at the same time proper maintenance of oral hygiene should be emphasise which will help to maintain the restorative work and prevent future damage.

INTRODUCTION :

Definition aims objectives of Conservative Dentistry scope and future of Conservative Dentistry.

1. Nomenclature Of Dentition:
   Tooth numbering systems A.D.A. Zsigmondy Palmer and F.D.I. systems.
2. Principles Of Cavity Preparation :
   Steps and nomenclature of cavity preparation classification of cavities, nomenclature of floors angles of cavities.
3. Dental Caries :
   Aetiology, classification clinical features, morphological features, microscopic features, clinical diagnosis and sequel of dental caries.
4. Treatment Planning For Operative Dentistry:
   Detailed clinical examination , radiographic examination, tooth vitality tests, diagnosis and treatment planning, preparation of the case sheet.
5. Gnathological Concepts Of Restoration:
   Physiology of occlusion, normal occlusion, Ideal occlusion, mandibular movements and occlusal analysis. Occlusal rehabilitation and restoration.
6. Aramamentarium For Cavity Preparation:
   General classification of operative instruments, Hand cutting instruments design formula and sharpening of instruments. Rotary cutting instruments dental bur, mechanism of cutting, evaluation of hand piece and speed current concepts of rotary cutting procedures. Sterilisation and maintenance of instruments. Basic instrument tray set up.
7. Control of Operating Filed:
   Light source sterilisation field of operation control of moisture, rubber dam in detail, cotton rolls and anti sialogagues.
8. Amalgam Restoration :
   Indication contraindication, physical and mechanical properties , clinical behaviour. Cavity preparation for Class I , II, V and III. Step wise procedure for cavity preparation and restoration. Failure of amalgam restoration.
9. Pulp Protection :
   Liners, varnishes and bases, Zinc phosphate, zinc polycarboxylate, zinc oxide eugenol and glass inomer cements.
10. Anterior Restorations :
    Selection of cases, selection of material, step wise procedures for using restorations , silicate (theory only) glass inomers, composites, including sand witch restorations and bevels of the same with a note on status of the dentine bonding agents.
11. Direct Filling Gold Restorations :
    Types of direct filling gold indications and limitations of cohesive gold. Annealing of gold foil cavity preparation and condensation of gold foils.
12. Preventive Measures In Restorative Practice :
    Plaque Control, Pitand fissure sealants dietary measures restorative procedure and periodontal health. Contact and contour of teeth and restorations matrices tooth separation and wedges.
13. Temporisation or Interim Restoration.
14. Pin Amalgam Restoration Indication Contra Indication :
    Advantages disadvantages of each types of pin methods of placement use of auto matrix. Failure of pin amalgam restoration.
15. Management Of Deep Carious Lesions Indirect And Direct Pulp Capping.
16. Non Carious Destruction's Tooth Structures Diagnosis and Clinical Management
17. Hyper Sensitive Dentine And Its Management.
18. Cast Restorations
    Indications, contra indications, advantages and disadvantages and materials used for same Class II and Class I cavity preparation for inlays fabrication of wax pattern spurring inverting and casting procedures & casting defects.

19. Die Materials And Preparation Of Dies.
20. Gingival Tissue Management For Cast Restoration And Impression Procedures
21. Recent Cavity Modification Amalgam Restoration.
22. Differences between Amalgam And Inlay Cavity preparation with note on all the types of Bewels used for Cast Restoration.
23. Control Of Pain During Operative Procedures.
24. Treatment Planning For Operative Dentistry Detailed Clinical Examination Radiographic Examination
25. Vitality Tests, Diagnosis And Treatment Planning And Preparation Of Case Sheet.
26. Applied Dental Materials.
    1. Biological Considerations.
       Evaluation, clinical application and adverse effects of the following materials. Dental cements, Zinc oxide euginol cements zinc phosphate cements, polycarboxylates glass ionomer cements, silicate cement calcium hydroxides varnishes.
    2. Dental amalgam, technical considerations mercury toxicity mercury hygiene.
    3. Composite, Dentine bonding agents, chemical and light curing composites
    4. Rubber base Imp. Materials
    5. Nobel metal alloys & non noble metal alloys
    6. Investment and die materials
    7. Inlay casting waxes
    8. Dental porcelain
    9. Aesthetic Dentistry
27. Endodontics: introduction definition scope and future of endodontics
28. Clinical diagnostic methods
29. Emergency endodontic procedures
30. Pulpal diseases causes, types and treatment .
31. Periapical diseases: acute periapical abscess, acute periodontal abscess phoeix abscess, chronic alveolar abscess granuloma cysts condensing osteits, external resorption.
32. Vital pulp therapy: indirect and direct pulp capping pulpotomy different types and medicaments used.
33. Apexogenisis and apexification or problems of open apex.
34. Rationale of endodontic treatment case selection indication and contraindications for root canal treatments.
35. Principles of root canal treatment mouth preparation root canal instruments, hand instruments, power driven instruments, standardisation color coding principle of using endodontic instruments. Sterilisation of root canal instruments and materials rubber dam application.
36. Anatomy of the pulp cavity: root canals apical foramen. Anomalies of pulp cavities access cavity preparation of anterior and premolar teeth.
37. Preparation of root canal space . Determination of working length, cleaning and shaping of root canals, irrigating solution chemical aids to instrumentation.
38. Disinfection of root canal space intracanal medicaments, poly antibiotic paste ross mans paste, mummifying agents. Out line of root canal treatment, bacteriological examinations, culture methods.
39. Problems during cleaning and shaping of root canal spaces. Perforation and its management. Broken instruments and its management, management of single and double curved root canals.
40. Methods of cleaning and shaping like step back crown down and conventional methods.
41. Obturation of the root canal system. Requirements of an ideal root canal filling material obturation methods using gutta percha healing after endodontic treatment. Failures in endodontics.
42. Root canal sealers. Ideal properties classification. Manipulation of root canal sealers.
43. post endodontic restoration fabrication and components of post core preparation.
44. smear layer and its importance in endodontics and conservative treatment.
45. discoloured teeth and its management. Bleaching agents, vital and non vital bleaching methods.
46. traumatised teeth classification of fractured teeth. Management of fractured tooth and root. Luxated teeth and its management.
47. endodontic surgeries indication contraindications, pre operative preparation. Pre medication surgical instruments and techniques apicectomy, retrograde filling, post operative sequale terphination hemisection, radiscetomy techniques of tooth reimplantation (both intentional and accidental) endodontic implants.
48. root resorption.
49. emergency endodontic procedures.
50. lasers in conservative endodontics (introduction only) practice management
51. professional association dentist act 1948 and its amendment 1993.
52. duties towards the govt. Like payments of professional tax, income tax.
53. financial management of practice
54. dental material and basic equipment management.
55. Ethics

12. ORAL & MAXILLOFACIAL SURGERY

AIMS:
To produce a graduate who is competent in performing extraction of teeth under both local and general anaesthesia, prevent and manage related complications, acquire a reasonable knowledge and understanding of the various diseases, injuries, infections occurring in the Oral & Maxillofacial region and offer solutions to such of those common conditions and has an exposure in to the in-patient management of maxillofacial problems.

OBJECTIVES:
a) Knowledge & Understanding:

At the end of the course and the clinical training the graduate is expected to -

1. Able to apply the knowledge gained in the related medical subjects like pathology, microbiology and general medicine in the management of patients with oral surgical problem.
2. Able to diagnose, manage and treat (understand the principles of treatment of) patients with oral surgical problems.
3. Knowledge of range of surgical treatments.
4. Ability to decide the requirement of a patient to have oral surgical specialist opinion or treatment.
5. Understand the principles of in-patient management.
6. Understanding of the management of major oral surgical procedures and principles involved in patient management.
7. Should know ethical issues and communication ability.

b) Skills:

1. A graduate should have acquired the skill to examine any patient with an oral surgical problem in an orderly manner. Be able to understand requisition of various clinical and laboratory investigations and is capable of formulating differential diagnosis.
2. Should be competent in the extraction of teeth under both local and general anaesthesia.
3. Should be able to carry out certain minor oral surgical procedures under L.A. like frenectomy, alveolar procedures & biopsy etc.
4. Ability to assess, prevent and manage various complications during and after surgery.
5. Able to provide primary care and manage medical emergencies in the dental office.
6. Understanding of the management of major oral surgical problems and principles involved in inpatient management.

DETAILED SYLLABUS

1. Introduction, definition, scope, aims and objectives.
2. Diagnosis in oral surgery:
   (A) History taking
   (B) Clinical examination
   (C) Investigations.
3. Principles of infection control and cross-infection control with particular reference to HIV/AIDS and Hepatitis.
4. Principles of Oral Surgery -
   a) Asepsis: Definition, measures to prevent introduction of infection during surgery.
      1. Preparation of the patient
      2. Measures to be taken by operator
      3. Sterilisation of instruments - various methods of sterilisation etc.
      4. Surgery set up.
   b) Painless Surgery:
      1. Pre-anaesthetic considerations. Pre-medication: purpose, drugs used
      2. Anaesthetic considerations -
         a) Local b) Local with IV sedations
      3. Use of general anaesthetic
   c) Access:
      Intra-oral: Mucoperiosteal flaps, principles, commonly used intra oral incisions.
      Bone Removal: Methods of bone removal.
      Use of Burs: Advantages & precautions
      Bone cutting instruments: Principles of using chisel & osteotome.
      Extra-oral: Skin incisions - principles, various extra-oral incision to expose facial skeleton.
         a) Submandibular
         b) Pre auricular
         c) Incision to expose maxilla & orbit
         d) Bicoronal incision
   d) Control of haemorrhage during surgery
      Normal Haemostasis
      Local measures available to control bleeding
      Hypotensive anaesthesia etc.
   e) Drainage & Debridement
      Purpose of drainage in surgical wounds

Types of drains used
Debridement: purpose, soft tissue & bone debridement.

f) Closure of wounds
Suturing: Principles, suture material, classification, body response to various materials etc.

g) Post operative care
Post operative instructions
Physiology of cold and heat
Control of pain - analgesics
Control of infection - antibiotics
Control of swelling - anti-inflammatory drugs
Long term post operative follow up - significance.

5. Exodontia: General considerations
Ideal Extraction.
Indications for extraction of teeth
Extractions in medically compromised patients.
Methods of extraction -
(a) Forceps or intra-alveolar or closed method.
Principles, types of movement, force etc.
(b) Trans-alveolar, surgical or open method, Indications, surgical procedure.
Dental elevators: uses, classification, principles in the use of elevators, commonly used elevators.
Complications of Exodontia -
Complications during exodontia
Common to both maxilla and mandible.
Post-operative complications -
Prevention and management of complications.

6. Impacted teeth:
Incidence, definition, aetiology.
(a) Impacted mandibular third molar.
Classification, reasons for removal,
Assessment - both clinical & radiological
Surgical procedures for removal.
Complications during and after removal,
Prevention and management.
(b) Maxillary third molar,
Indications for removal, classification,
Surgical procedure for removal.
(c) Impacted maxillary canine
Reasons for canine impaction,
Localization, indications for removal,
Methods of management, labial and palatal approach,
Surgical exposure, transplantation, removal etc.

7. Pre-prosthetic Surgery:
Definition, classification of procedures
(a) Corrective procedures: Alveoloplasty,
Reduction of maxillary tuberosities,
Frenoctemies and removal of tori.
(b) Ridge extension or Sulcus extension procedures
Indications and various surgical procedures
(c) Ridge augmentation and reconstruction.
Indications, use of bone grafts, Hydroxyapatite
Implants - concept of osseo integration
Knowledge of various types of implants and
surgical procedure to place implants.

8. Diseases of the maxillary sinus
Surgical anatomy of the sinus.
Sinusitis both acute and chronic
Surgical approach of sinus - Caldwell-Luc procedure
Removal of root from the sinus.
Oro-antral fistula - aetiology, clinical features and various surgical methods for closure.

9. Disorders of T.M. Joint
Applied surgical anatomy of the joint.
Dislocation - Types, aetiology, clinical features and management.
Ankylosis - Definition, aetiology, clinical features and management
Myo-facial pain dysfunction syndrome, aetiology, clinical features, management- Non surgical and surgical.

Internal derangement of the joint.
Arthritis of T.M. Joint.

10. Infections of the Oral cavity
    Introduction, factors responsible for infection, course of odontogenic infections, spread of odontogenic infections through various facial spaces.
    Dento-alveolar abscess - aetiology, clinical features and management.
    Osteomyelitis of the jaws - definition, aetiology, pre-disposing factors, classification, clinical features and management.
    Ludwigs angina - definition, aetiology, clinical features, management and complications.
11. Benign cystic lesions of the jaws -
    Definition, classification, pathogenesis.
    Diagnosis - Clinical features, radiological, aspiration biopsy, use of contrast media and histopathology.
    Management - Types of surgical procedures, Rationale of the techniques, indications, procedures, complications etc.
12. Tumours of the Oral cavity -
    General considerations
    Non odontogenetic benign tumours occuring in oral cavity - fibroma, papilloma, lipoma, ossifying fibroma, mynoma etc.
    Ameloblastoma - Clinical features, radiological appearance and methods of management.
    Carcinoma of the oral cavity -
    Biopsy - types
    TNM classification.
    Outline of management of squamous
    Cell carcinoma: surgery, radiation and chemotherapy
    Role of dental surgeons in the prevention and early detection of oral cancer.
13. Fractures of the jaws -
    General considerations, types of fractures, aetiology, clinical features and general principles of management.
    mandibular fractures - Applied anatomy, classification.
    Diagnosis - Clinical and radiological
    Management - Reduction closed and open
    Fixation and immobilisation methods
    Outline of rigid and semi-rigid internal fixation.
    Fractures of the condyle - aetiology, classification, clinical features, principles of management.
    Fractures of the middle third of the face.
    Definition of the mid face, applied surgical anatomy, classification, clinical features and outline of management.
    Alveolar fractures - methods of management
    Fractures of the Zygomatic complex
    Classification, clinical features, indications for treatment, various methods of reduction and fixation.
    Complications of fractures - delayed union, non-union and malunion.
14. Salivary gland diseases -
    Diagnosis of salivary gland diseases'
    Sialography, contrast media, procedure.
    Infections of the salivary glands
    Sialolithiasis - Sub mandibular duct and gland and parotid duct.
    Clinical features, management.
    Salivary fistulae
    Common tumours of salivary glands like Pleomorphic adenoma including minor salivary glands.
15. Jaw deformities -
    Basic forms - Prognathism, Retrognathism and open bite.
    Reasons for correction.
    Outline of surgical methods carried out on mandible and maxilla.
16. Neurological disorders -
    Trigeminal neuralgia - definition, aetiology, clinical features and methods of management including surgical.
    Facial paralysis - Aetiology, clinical features.
    Nerve injuries - Classification, neurorhaphy etc.
17. Cleft Lip and Palate -
    Aetiology of the clefts, incidence, classification, role of dental surgeon in the management of cleft patients. Outline of the closure procedures.

18. Medical Emergencies in dental practice –

Primary care of medical emergencies in dental practice particularly -
(a)Cardio vascular (b) Respiratory(c) Endocrine
(d)Anaphylactic reaction (e) Epilepsy (f) Epilepsy

19. Emergency drugs & Intra muscular I.V. Injections -
Applied anatomy, Ideal location for giving these injections, techniques etc.
20. Oral Implantology
21. Ethics

LOCAL ANAESTHESIA:
Introduction, concept of L.A., classification of local anaesthetic agents, ideal requirements, mode of action, types of local anaesthesia, complications.

Use of Vaso constrictors in local anaesthetic solution -
Advantages, contra-indications, various vaso constrictors used.
Anaesthesia of the mandible -
Pterygomandibular space - boundaries, contents etc.
Interior Dental Nerve Block - various techniques
Complications
Mental foramen nerve block
Anaesthesia of Maxilla -
Intra - orbital nerve block.
Posterior superior alveolar nerve block
Maxillary nerve block - techniques.

GENERAL ANAESTHESIA –

Concept of general anaesthesia.
Indications of general anaesthesia in dentistry.
Pre-anaesthetic evaluation of the patient.
Pre-anaesthetic medication - advantages, drugs used.
Commonly used anaesthetic agents.
Complication during and after G.A.
I.V. sedation with Diazepam and Medozolam.
Indications, mode of action, technique etc.
Cardiopulmonary resuscitation
Use of oxygen and emergency drugs.
Tracheostomy.

RECOMMENDED BOOKS:

1. Impacted teeth; Alling John F & etal.
2. Principles of oral and maxillofacial surgery; Vol.1,2 & 3 Peterson LJ & etal.
3. Text book of oral and maxillofacial surgery; Srinivasan B.
4. Handbook of medical emergencies in the dental office, Malamed SF.
5. Killeys Fractures of the mandible; Banks P.
6. Killeys fractures of the middle 3rd of the facial skeleton; Banks P.
7. The maxillary sinus and its dental implications; McGovanda
8. Killey and Kays outline of oral surgery – Part-1; Seward GR & etal
9. Essentials of safe dentistry for the medically compromised patients; Mc Carthy FM
10. Oral & maxillofacial surgery, Vol 2; Laskin DM
11. Extraction of teeth;Howe, GL
12. Minor Oral Surgery; Howe.GL
13. Contemporary oral and maxillofacial surgery; Peterson I.J.& EA
14. Oral and maxillofacial infections; Topazian RG & Goldberg MH

13. ORAL MEDICINE AND RADIOLOGY

AIMS:

(1) To train the students to diagnose the common disorders of Orofacial region by clinical examination and with the help of such investigations as may be required and medical management of oro-facial disorders with drugs and physical agents.
(2) To train the students about the importance, role, use and techniques of radiographs/digital radiograph and other imaging methods in diagnosis.
(3) The principles of the clinical and radiographic aspects of Forensic Odontology.
The syllabus in ORAL MEDICINE & RADIOLOGY is divided into two main parts.
(I) Diagnosis, Diagnostic methods and Oral Medicine (II) Oral Radiology. Again the part ONE is subdivided into three sections. (A) Diagnostic methods (B) Diagnosis and differential diagnosis (C) Oral Medicine & Therapeutics.

COURSE CONTENT

(1) Emphasis should be laid on oral manifestations of systemic diseases and ill-effects of oral sepsis on general health.
(2) To avoid confusion regarding which lesion and to what extent the student should learn and know, this elaborate syllabus is prepared. As certain lesions come under more than one group, there is repetition.

Part-I ORAL MEDICINE AND DIAGNOSTIC AIDS

SECTION (A) – DIAGNOSTIC METHODS.

(1) Definition and importance of Diagnosis and various types of diagnosis
(2) Method of clinical examinations.
(a) General Physical examination by inspection.
(b) Oro-facial region by inspection, palpation and other means
(c) To train the students about the importance, role, use of saliva and techniques of diagnosis of saliva as part of oral disease
(d) Examination of lesions like swellings, ulcers, erosions, sinus, fistula, growths, pigmented lesions, white and red patches
(e) Examination of lymph nodes
(f) Forensic examination – Procedures for post-mortem dental examination; maintaining dental records and their use in dental practice and post-mortem identification; jurisprudence and ethics.
(3) Investigations
(a) Biopsy and exfoliative cytology
(b) Hematological, Microbiological and other tests and investigations necessary for diagnosis and prognosis

SECTION (B) – DIAGNOSIS, DIFFERENTIAL DIAGNOSIS

While learning the following chapters, emphasis shall be given only on diagnostic aspects including differential diagnosis

(1) Teeth: Developmental abnormalities, causes of destruction of teeth and their sequelae and discoloration of teeth
(2) Diseases of bone and Osteodystrophies: Development disorders: Anomalies, Exostosis and tori, infantile cortical hyperostosis, osteogenisis imperfecta, Marfans syndrome, osteopetrosis. Inflamation – Injury, infection and sperad of infection,fascial space infections, osteoradionecrosis.
Metabolic disorders – Histiocytosis
Endocrine – Acro-megaly and hyperparathyroidism
Miscellaneous – Paget's disease, Mono and polyostotic fibrous dysplasia, Cherubism.
(3) Temparomandibular joint: Developmental abnormalities of the condyle. Rheumatoid arthritis, Osteoarthritis, Sub-luxation and luxation.
(4) Common cysts and Tumors:
CYSTS: Cysts of soft tissue: Mucocele and Ranula
Cysts of bone: Odontogenic and nonodontogenic.

TUMORS:
Soft Tissue:
Epithelial: Papilloma, Carcinoma, Melanoma
Connective tissue: Fibroma, Lipoma, Fibrosarcoma
Vascular: Haemangioma, Lymphangioma
Nerve Tissue: Neurofibroma, Traumatic Neuroma, Neurofibromatosis
Salivary Glands: Pleomorphic adenoma, Adenocarcinoma, Warthin's Tumor, Adenoid cystic carcinoma.
Hard Tissue:
Non Odontogenic: Osteoma, Osteosarcoma, Osteoclastoma, Chondroma, Chandrosarcoma, Central giant cell rumor, and Central haemangioma
Odontogenic: Enameloma, Ameloblastoma, Calcifying Epithelial Odontogenic tumor, Adenomatoid Odontogenic tumor, Periapical cemental dysphasia and odontomas

(5) Periodontal diseases: Gingival hyperplasia, gingivitis, periodontitis, pyogenic granuloma
(6) Granulomatous diseases: Tuberculosis, Sarcoidosis, Midline lethal granuloma, Crohn's Disease and Histiocytosis X
(7) Miscellaneous Disorders: Burkitt lymphoma, sturge – Weber syndrome, CREST syndrome, rendu-osler-weber disease

SECTION (C): ORAL MEDICINE AND THERAPEUTICS.

The following chapters shall be studied in detail including the eiology, pathogenesis, clinical features, investigations, differential diagnosis, management and prevention

(1) Infections of oral and paraoral structures:
Bacterial: Streptococcal, tuberculosis, syphillis, vincents, leprosy, actinomycosis, diphtheria and tetanus
Fungal: Candida albicans
Virus: Herpes simplex, herpes zoster, ramsay hunt syndrome, measles, herpangina, mumps, infectious mononucleosis, AIDS and hepatitis-B
(2) Important common mucosal lesions:
White lesions: Chemical burns, leukodema, leukoplakia, fordyce spots, stomatitis nicotina palatinus, white sponge nevus, candidiasis, lichenplanus, discoid lupus erythematosis
Veiculo-bullous lesions: Herpes simplex, herpes zoster, herpangina, bullous lichen planus, pemphigus, cicatricial pemphigoid erythema multiforme.
Ulcers: Acute and chronic ulcers
Pigmented lesions: Exogenous and endogenous

Red lesions: Erythroplakia, stomatitis venenata and medicamentosa, erosive lesions and denture sore mouth.

(3) Cervico-facial lymphadenopathy

(4) Facial pain:

(i)Organic pain: Pain arising from the diseases of orofacial tissues like teeth, pulp, gingival, periodontal tissue, mucosa, tongue, muscles, blood vessels, lymph tissue, bone, paranasal sinus, salivary glands etc.,

(ii) Pain arising due to C.N.S. diseases:

(a) Pain due to intracranial and extracranial involvement of cranial nerves. (Multiple sclerosis, cerebrovascular diseases, trotter's syndrome etc.)

(b) Neuralgic pain due to unknown causes: Trigeminal neuralgia, glossopharyngeal neuralgia, sphenopalatine ganglion neuralgia, periodic migrainous neuralgia and atypical facial pain

(iii) Referred pain: Pain arising from distant tissues like heart, spine etc.,

(5) Altered sensations: Cacogeusia, halitosis

(6) Tongue in local and systemic disorders: (Aglossia, ankyloglossia, bifid tongue, fissured tongue, scrotal tongue, macroglossia, microglossia, geographic tongue, median rhomboid glossitis, depapillation of tongue, hairy tongue, atrophic tongue, reactive lymphoid hyperplasia, glossodynia, glossopyrosis, ulcers, white and red patches etc.)

(7) Oral manifestations of:

(i) Metabolic disordeers:

(a) Porphyria

(b) Haemochromatosis

(c) Histocytosis X diseases

(ii) Endocrine disorders:

(a) Pituitary: Gigantism, acromegaly, hypopitutarism

(b) Adrenal cortex: Addison's disease (Hypofuntion)
Cushing's syndrome (Hyperfunction)

(c) Parathyroid glands: Hyperparathyroidism.

(d) Thyroid gland: (Hypothyroidism) Cretinism, myxedema

(e) Pancreas: Diabetes

(iii) Nutritional deficiency: Vitamins: riboflavin, nicotinic acid, folic acid Vitamin B12, Vitamin C (Scurvy)

(iv) Blood disorders:

(a) Red blood cell diseases
Defficiency anemias: (Iron deficiency, plummer – vinson syndrome, pernicious anemia)
Haemolytic anemias: (Thalassemia, sickle cell anemia, erythroblastosis fetalis)
Aplastic anemia
Polycythemia

(b) White Blood cell diseases
Neutropenia, cyclic neutropenia, agranulocytosis, infectious mononeucleosis and leukemias

(c) Haemorrhagic disorders:
Thrombocytopenia, purpura, hemophillia, chrismas disease and von willebrand's disease

(8) Disease of salivary glands:

(i)Development distrubances: Aplasia, atresia and aberration

(ii) Functional disturbances:Xerostomia, ptyalism

(iii) Inflammatory conditions: Nonspecific sialadenitis, mumps, sarcoidosis heerdfort's syndrome (Uveoparotid fever), Necrotising sialometaplasia

(iv) Cysts and tumors: Mucocele, ranula, pleomorphic adenoma, mucoepidermoid carcinoma

(v) Miscellaneous: Sialolithiasis, sjogren's syndrome, mikuliez's disease and sialosis

(9) Dermatological diseases with oral manifestations:

(a) Ectodermal dysplasia (b) Hyperkerotosis palmarplantaris with periodont0opathy (c) Scleroderma (d) Lichen planus including ginspan's syndrome (e) Luplus erythematosus (f) Pemphigus (g) Erythema multiforme (h) Psoriasis

(10)Immunological diseases with oral manifestations

(a) Leukemia (b) Lymphomas (c) Multiple mycloma (d) AIDS clinical manifestations, opportunistic infections, neoplasms (e) Thrombcytopenia (f) Lupus erythematosus (g) Scleroderma (h) dermatomyositis (I) Submucous fibrosis (j) Rhemtoid arthritis (k) Recurrent oral ulcerations including behcet's syndrome and reiter's syndrome

(11)Allergy: Local allergic reactions, anaphylaxis, serum sickness (local and systemic allergic manifestations to food drugs and chemicals)

(12)Foci of oral infection and their ill effects on general health

(13)Management of dental problems in medically comrpomised persons:

(i)Physiological changes: Puberty, pregnancy and menopause

(ii) The patients suffering with cardiac, respiratory, liver, kidney and bleeding disorders, hypertension, diabetes and AIDS. Post-irradiated patients.

(14)Precancerous lesions and conditions

(15)Nerve and muscle diseases:

(i)Nerves: (a) Neuropraxia (b) Neurotemesis (c) Neuritis (d) Facial nerve paralysis including Bell's palsy, Heerfordt's syndrome, Melkerson Rosenthel syndrome and ramsay hunt syndrome (e) Neuroma (f) Neurofibromatosis (g) Frey'syndrome

(ii) Muscles: (a) Myositis ossificans (b) Myofascial pain dysfunction syndrome (c) Trismus

(16)Forensic odontology:

(a) Medicolegal aspects of orofacial injuries
(b) Identification of bite marks
(c) Determination of age and sex
(d) Identification of cadavers by dental appliances, Restorations and tissue remanants

(17)Therapeutics: General therapeutic measures – drugs commonly used in oral medicine viz., antibiotics, chemotherapeutic agents, anti-inflammatory and analgesic drugs, astringents, mouth washes, styptics, demelucents, local surface anaesthetic, sialogogues, antisialogogues and drugs used in the treatment of malignancy

Part – II BEHAVIOURAL SCIENCES AND ETHICS.

Part – III ORAL RADIOLOGY

(1) Scope of the subject and history of origin
(2) Physics of radiation: (a) Nature and types of radiations (b) Source of radiations (c) Production of X-rays (d) Properties of X-rays (e) Compton effect (f) Photoelectric effect (g) Radiation measuring units
(3) Biological effects of radiation
(4) Radiation safety and protection measures
(5) Principles of image production
(6) Radiographic techniques:
(i)Intra-Oral: (a) Periapical radiographs (Bisecting and parallel technics) (b) Bite wing radiographs (c) Occlusal radiographs
(ii) Extra-oral: (a) Lateral projections of skull and jaw bones and paranasal sinuses (c) Cephalograms (d) Orthopantomograph (e) Projections of temperomandibular joint and condyle of mandible (f) Projections for Zygomatic arches
(iii) Specialised techniques: (a) Sialography (b) Xeroradiography (c) Tomography
(7) Factors in production of good radiographs:
(a) K.V.P. and mA.of X-ray machine (b) Filters (c) Collimations (d) Intensifying screens (e) Grids (f) X-ray films (g) Exposure time (h) Techniques (i) Dark room (j) Developer and fixer solutions (k) Film processing
(8) Radiographic normal anatomical landmarks
(9) Faculty radiographs and artefacts in radiographs
(10) Interpretation of radiographs in various abnormalities of teeth, bones and other orofacial tissues
(11) Principles of radiotherapy of oro-facial malignancies and complications of radiotherapy
(12) Cantrast radiography and basic knowledge of radio-active isotopes
(13)Radiography in Forensic Odontoloy - Radiographic age estimation and post-mortem radiographic methods

PRACTICALS / CLINICALS:

1. Student is trained to arrive at proper diagnosis by following a scientific and systematic proceedure of history taking and examination of the orofacial region. Training is also imparted in management wherever possible. Training also shall be imparted on saliva diagnostic procedures. Training also shall be imparted in various radiographic proceedures and interpretation of radiographs.
2. In view of the above each student shall maintain a record of work done, which shall be evaluated for marks at the time of university examination
3. The following is the minimum of prescribed work for recording
   (a) Recording of detailed case histories of interesting cases 10
   (b) Intra-oral radiographs (Periapical, bitewing, occlusal) 25
   (c) Saliva diagnostic check as routine procedure

BOOKS RECOMMENDED:

a) Oral Diagnosis, Oral Medicine & Oral Pathology
1. Burkit – Oral Medicine – J.B. Lippincott Company
2. Coleman – Principles of Oral Diagnosis – Mosby Year Book
3. Jones – Oral Manifestations of Systemic Diseases – W.B. Saunders company
4. Mitchell – Oral Diagnosis & Oral Medicine
5. Kerr – Oral Diagnosis
6. Miller – Oral Diagnosis & Treatment
7. Hutchinson – clinical Methods
8. Oral Pathology – Shafers
9. Sonis.S.T., Fazio.R.C. and Fang.L - Principles and practice of Oral Medicine

b) Oral Radiology
1. White & Goaz – Oral Radiology – Mosby year Book
2. Weahrman – Dental Radiology – C.V. Mosby Company
3. Stafne – Oral Roentgenographic Diagnosis – W.B.Saunders Co.,

c) Forensic Odontology

1. Derek H.Clark – Practical Forensic Odontology - Butterworth-Heinemann (1992)
2.C Michael Bowers, Gary Bell – Manual of Forensic Odontology - Forensic Pr (1995)

14. ORTHODONTICS & DENTAL ORTHOPAEDICS

COURSE OBJECTIVE:

Undergraduate programme in Orthodontics is designed to enable the qualifying dental surgeon to diagnose, analyse and treat common orthodontic problems by preventive, interceptive and corrective orthodontic procedures. The following basic instructional procedures will be adapted to achieve the above objectives.

1. Introduction, Definition, Historical Background, Aims And Objectives Of Orthodontics And Need For Orthodontics Care.
2. Growth And Development: In General
   a. Definition
   b. Growth spurts and Differential growth
   c. Factors influencing growth and Development
   d. Methods of measuring growth
   e. Growth theories (Genetic, Sicher's, Scott's, Moss's,Petrovics, Multifactorial)
   f. Genetic and epigenetic factors in growth
   g. Cephalocaudal gradient in growth.
3. Morphologic Development Of Craniofacial Structures
   a. Methods of bone growth
   b. Prenatal growth of craniofacial structures
   c. Postnatal growth and development of: cranial base, maxilla, mandible, dental arches and occlusion.
4. Functional Development Of Dental Arches And Occlusioin
   a. Factors influencing functional development of dental arches and occlusion.
   b. Forces of occlusion
   c. Wolfe's law of transformation of bone
   d. Trajectories of forces
5. Clinical Application Of Growth And Development
6. Malocclusion - In General
   a. Concept of normal occlusion
   b. Definition of malocclusion
   c. Description of different types of dental, skeletal and functional malocclusion.
7. Classification of Malocclusion
   Principle, description, advantages and disadvantages of classification of malocclusion by Angle's, Simon's, Lischer's and Ackerman and Proffitt's.
8. Normal And Abnormal Function Of Stomatognathic System
9. Etiology Of Malocclusion
   a. Definition, importance, classification, local and general etiological factors.
   b. Etiology of following different types of malocclusion:
   1) Midline diastema
   2) Spacing
   3) Crowding
   4) Cross-Bite: Anterior/Posterior
   5) Class III Malocclusion
   6) Class II Malocclusion
   7) Deep Bite
   8) Open bite
10. Diagnosis And Diagnostic Aids
    a. Definition, Importance and classification of diagnostic aids
    b. Importance of case history and clinical examination in orthodontics
    c. Study Models: - Importance and uses - Preparation and preservation of study models
    d. Importance of intraoral X-rays in orthodontics
    e. Panoramic radiographs: - Principles, Advantages, disad vantages and uses
    f. Cephalometrics: Its advantages, disadvantages
    1. Definition
    2. Description and use of cephalostat
    3. Description and uses of anatomical landmarks lines and angles used in cephalometric analysis
    4. Analysis- Steiner's, Down's, Tweed's, Ricket's-E- line
    g. Electromyography and its uses in orthodontics
    h. Wrist X-rays and its importance in othodontics
11. General Principles In Orthodontic Treatment Planning Of Dental And Skeletal Malocclusions
12. Anchorage In Orthodontics - Definition, Classification, Types and Stability Of Anchorage
13. Biomechanical Principles In Orthodontic Tooth Movement
    a. Different types of tooth movements
    b. Tissue response to orthodontic force application

c. Age factor in orthodontic tooth movement

14. Preventive Orthodontics
    a. Definition
    b. Different procedures undertaken in preventive orthodontics and their limitations.
15. Interceptive Orthodontics
    a. Definition
    b. Different procedures undertaken in interceptive orthodontics
    c. Serial extractions: Definition, indications, contra-indication, technique, advantages and disadvantages.
    d. Role of muscle exercises as an interceptive procedure
16. Corrective Orthodontics
    a. Definition, factors to be considered during treatment planning.
    b. Model analysis: Pont's, Ashley Howe's, Bolton, Careys, Moyer's Mixed Dentition Analysis
    c. Methods of gaining space in the arch:- Indications, relative merits and demerits of proximal stripping, arch expansion and extractions
    d. Extractions in Orthdodontics - indications and selection of teeth for extraction.
17. Orthodontic Appliances: General
    a. Requisites for orthodontic appliances
    b. Classification, indications of Removable and Functional Appliances
    c. Methods of force application
    d. Materials used in construction of various orthodontic appliances - uses of stainless steel, technical considerations in curing of acrylic, Principles of welding and soldering, fluxes and antifluxes.
    e. Preliminary knowledge of acid etching and direct bonding.
18. Ethics

REMOVABLE ORTHODONTIC APPLIANCES

1) Components of removable appliances
2) Different types of clasps and their uses
3) Different types of labial bows and their uses
4) Different types of springs and their uses
5) Expansion appliances in orthodontics:
   i) Principles
   ii) Indications for arch expansion
   iii) Description of expansion appliances and different types of expansion devices and their uses.
   iv) Rapid maxillary expansion

FIXED ORTHODONTIC APPLIANCES

1. Definition, Indications & Contraindications
2. Component parts and their uses
3. Basic principles of different techniques: Edgewise, Begg's, straight wire.

EXTRAORAL APPLIANCES

1. Headgears
2. chincup
3. reverse pull headgears

MYOFUNCTIONAL APPLIANCES

1. Definition and principles
2. Muscle exercises and their uses in orthodontics
3. Functional appliances:
   i) Activator, Oral screens, Frankels function regulator, bionator twin blocks, lip bumper
   ii) Inclined planes - upper and lower

18. Orthodontic Management Of Cleft Lip And Palate
19. Principles Of Surgical Orthodontics
    Brief knowledge of correction of:
    a. Mandibular Prognathism and Retrognathism
    b. Maxillary Prognathism and Retrognathism
    c. Anterior open bite and deep bite
    d. Cross bite
20. Principle, Differential Diagnosis & Methods Of Treatment Of:
    1. Midline diastema
    2. Cross bite
    3. Open bite
    4. Deep bite
    5. Spacing
    6. Crowding
    7. Class II - Division 1, Division 2
    8. Class III Malocclusion - True and Psuedo Class III

21. Retention And Relapse

Definition, Need for retention, Causes of relapse, Methods of retention, Different types of retention devices, Duration of retention, Theories of retention.

CLINICALS AND PRACTICALS IN ORTHODONTICS

PRACTICAL TRAINING DURING II YEAR B.D.S.

I. Basic wire bending exercises Gauge 22 or 0.7mm
   1. Straightening of wires (4 Nos.)
   2. Bending of a equilateral triangle
   3. Bending of a rectangle
   4. Bending of a square
   5. Bending of a circle
   6. Bending of U.V.

II. Construction of Clasps (Both sides upper/lower) Gauge 22 or 0.7mm
   1. 3/4 Clasp (C-Clasp)
   2. Full Clasp (Jackson's Crib)
   3. Adam's Clasp
   4. Triangular Clasp

III. Construction of Springs (on upper both sides) Gauge 24 or 0.5mm
   1. Finger Spring
   2. Single Cantelever Spring
   3. Double Cantelever Spring (Z-Spring)
   4. T-Springs on premolars

IV. Construction of Canine retractors Gauge 23 or 0.6mm
   1. U - Loop canine retractor
      (Both sides on upper & lower)
   2. Helical canine retractor
      (Both sides on upper & lower)
   3. Buccal canine retractor:
      - Self supported buccal canine retractor with
        a) Sleeve - 5mm wire or 24 gauge
        b) Sleeve - 19 gauge needle on any one side.
   4. Palatal canine retractor on upper both sides
      Gauge 23 or 0.6mm

V. Labial Bow
   Gauge 22 or 0.7mm
   One on both upper and lower

CLINICAL TRAINING DURING III YEAR B.D.S.

NO. EXERCISE
01. Making upper Alginate impression
02. Making lower Alginate impression
03. Study Model preparation
04. Model Analysis
   a. Pont's Analysis
   b. Ashley Howe's Analysis
   c. Carey's Analysis
   d. Bolton's Analysis
   e. Moyer's Mixed Dentition Analysis

CLINICAL TRAINING DURING FINAL YEAR B.D.S.

NO. EXERCISE
01. Case History taking
02. Case discussion
03. Discussion on the given topic
04. Cephalometric tracings
   a. Down's Analysis
   b. Steiner's Analysis
   c. Tweed's Analysis

PRACTICAL TRAINING DURING FINAL YEAR B.D.S.

1. Adam's Clasp on Anterior teeth Gauge 0.7mm
2. Modified Adam's Clasp on upper arch Gauge 0.7mm
3. High Labial bow with Apron spring on upper arch
   (Gauge of Labial bow - 0.9mm, Apron spring - 0.3mm)
4. Coffin spring on upper arch Gauge 1mm

Appliance Construction in Acrylic

1. Upper & Lower Hawley's Appliance
2. Upper Hawley's with Anterior bite plane
3. Upper Habit breaking Appliance

4. Upper Hawley's with Posterior bite plane with `Z' Spring
5. Construction of Activator
6. Lower inclined plane/Catalan's Appliance
7. Upper Expansion plate with Expansion Screw

RECOMMENDED AND REFERENCE BOOKS

1. CONTEMPORARY ORTHODONTICS — WILLIAM R. PROFFIT
2. ORTHODONTICS FOR DENTAL STUDENTS — WHITE and GARDINER
3. HANDBOOK OF ORTHODONTICS — MOYERS
4. ORTHODONTICS - PRINCIPLES AND PRACTICE — GRABER
5. DESIGN, CONSTRUCTION AND USE OF REMOVABLE
6. ORTHODONTIC APPLIANCES — C. PHILIP ADAMS
7. CLINICAL ORTHODONTICS: VOL1 & 2 — SALZMANN

15. PAEDIATRIC & PREVENTIVE DENTISTRY

THEORY:

1. INTRODUCTION TO PEDODONTICS & PREVENTIVE DENTISTRY.
   - Definition, Scope, Objectives and Importance.
2. GROWTH & DEVELOPMENT:
   - Importance of study of growth and development in Pedodontics.
   - Prenatal and Postnatal factors in growth & development.
   - Theories of growth & development.
   - Development of maxilla and mandible and related age changes.
3. DEVELOPMENT OF OCCLUSION FROM BIRTH THROUGH ADOLESCENCE.
   - Study of variations and abnormalities.
4. DENTAL ANATOMY AND HISTOLOGY:
   - Development of teeth and associated structures.
   - Eruption and shedding of teeth.
   - Teething disorders and their management.
   - Chronology of eruption of teeth.
   - Differences between deciduous and permanent teeth.
   - Development of dentition from birth to adolescence.
   - Importance of first permanent molar.
5. DENTAL RADIOLOGY RELATED TO PEDODONTICS.
6. ORAL SURGICAL PROCEDURES IN CHILDREN.
   - Indications and contraindications of extractions of primary and permanent teeth in children.
   - Knowledge of Local and General Anesthesia.
   - Minor surgical procedures in children.
7. DENTAL CARIES:
   - Historical background.
   - Definition, aetiology & pathogenesis.
   - Caries pattern in primary, young permanent and permanent teeth in children.
   - Rampant caries, early childhood caries and extensive caries:
     * Definition, aetiology, Pathogenesis, Clinical features, Complications & Management
   - Role of diet and nutrition in Dental Caries.
   - Dietary modifications & Diet counseling.
   - Caries activity, tests, caries prediction, caries susceptibility & their clinical application.
8. GINGIVAL & PERIODONTAL DISEASES IN CHILDREN.
   - Normal gingiva & periodontium in children.
   - Definition, aetiology & Pathogenesis.
   - Prevention & Management of gingival & Periodontal diseases.
9. CHILD PSYCHOLOGY:
   - Definition.
   - Theories of child psychology.
   - Psychological development of children with age.
   - Principles of psychological growth & development while managing child patient.
   - Dental fear and its management.
   - Factors affecting child’s reaction to dental treatment.
10. BEHAVIOUR MANAGEMENT:
   - Definitions.
   - Types of behaviour encountered in the dental clinic.
   - Non-pharmacological & pharmacological methods of Behaviour Management.
11. PEDIATRIC OPERATIVE DENTISTRY:
   - Principles of Pediatric Operative Dentistry.
   - Modifications required for cavity preparation in primary and young permanent teeth.
   - Various Isolation Techniques.
   - Restorations of decayed primary, young permanent and permanent teeth in children using various restorative materials like Glass Ionomer, Composites & Silver Amalgam. Stainless steel, Polycarbonate & Resin Crowns.

12. PEDIATRIC ENDODONTICS
    - Principles & Diagnosis.
    - Classification of Pulpal Pathology in primary, young permanent & permanent teeth.
    - Management of Pulpally involved primary, young permanent & permanent teeth.
        - Pulp capping – direct & indirect.
        - Pulpotomy
        - Pulpectomy
        - Apexogenesis
        - Apexification
    - Obturation Techniques & material used for primary, young permanent & Permanent teeth in children.
13. TRAUMATIC INJURIES IN CHILDREN:
    - Classifications & Importance.
    - Sequelae & reaction of teeth to trauma.
    - Management of Traumatized teeth.
14. PREVENTIVE & INTERCEPTIVE ORTHODONTICS:
    - Definitions.
    - Problems encountered during primary and mixed dentition phases & their management.
    - Serial extractions.
    - Space management.
15. ORAL HABITS IN CHILDREN:
    - Definition, Aetiology & Classification.
    - Clinical features of digit sucking, tongue thrusting, mouth breathing & various other secondary habits.
    - Management of oral habits in children.
16. DENTAL CARE OF CHILDREN WITH SPECIAL NEEDS:
    - Definition, Aetiology, Classification, Behavioural and Clinical features & Management of children with:
        - Physically handicapping conditions.
        - Mentally compromising conditions.
        - Medically compromising conditions.
        - Genetic disorders.
17. CONGENITAL ABNORMALITIES IN CHILDREN:
    - Definition, Classification, Clinical features & Management.
18. DENTAL EMERGENCIES IN CHILDREN & THEIR MANAGEMENT.
19. DENTAL MATERIALS USED IN PEDIATRIC DENTISTRY.
20. PREVENTIVE DENTISTRY:
    - Definition.
    - Principles & Scope.
    - Types of prevention.
    - Different preventive measures used in Pediatric Dentistry including pit and fissure sealants and caries vaccine.
21. DENTAL HEALTH EDUCATION & SCHOOL DENTAL HEALTH PROGRAMMES.
22. FLUORIDES:
    - Historical background.
    - Systemic & Topical fluorides.
    - Mechanism of action.
    - Toxicity & Management.
    - Defluoridation techniques.
23. CASE HISTORY RECORDING:
    - Outline of principles of examination, diagnosis & treatment planning.
24. SETTING UP OF PEDODONTIC CLINIC.
25. ETHICS.

B. PRACTICALS:

Following is the recommended clinical quota for under-graduate students in the subject of pediatric & preventive dentistry.

1. Restorations – Class I & II only : 45
2. Preventive measures e.g. Oral Prophylaxis – 20.
3. Fluoride applications – 10
4. Extractions – 25
5. Case History Recording & Treatment Planning – 10
6. Education & motivation of the patients using disclosing agents. Educating patients about oral hygiene measures like tooth brushing, flossing etc.

BOOKS RECOMMENDED & REFERENCE:

1. Pediatric Dentistry (Infancy through Adolescences) – Pinkham.
2. Kennedy's Pediatric Operative Dentistry – Kennedy & Curzon.
3. Occlusal guidance in Pediatric Dentistry – Stephen H. Wei.
4. Clinical Use of Fluorides – Stephen H. Wei.

5. Pediatric Oral & Maxillofacial Surgery – Kaban.
6. Pediatric Medical Emergencies – P. S. whatt.
7. Understanding of Dental Caries – Niki Foruk.
8. An Atlas of Glass Ionomer cements – G. J. Mount.
9. Clinical Pedodontics – Finn.
10. Textbook of Pediatric Dentistry – Braham Morris.
11. Primary Preventive Dentistry – Norman O. Harris.
12. Handbook of Clinical Pedodontics – Kenneth. D.
13. Preventive Dentistry – Forrester.
14. The Metabolism and Toxicity of Fluoride – Garry M. whitford.
15. Dentistry for the Child and Adolescence – Mc. Donald.
16. Pediatric Dentistry – Damle S. G.
17. Behaviour Management – Wright
18. Pediatric Dentistry – Mathewson.
19. Traumatic Injuries – andreason.
20. Occlusal guidance in Pediatric Dentistry – Nakata.
21. Pediatric Drug Therapy – Tomare
22. Contemporary Orhtodontics – Profitt..
23. Preventive Dentistry – Depaola.
24. Metabolism & Toxicity of Fluoride – whitford. G. M.
25. Endodontic Practice – Grossman.
26. Principles of Endodontics – Munford.
27. Endodontics – Ingle.
28. Pathways of Pulp – Cohen.
29. Management of Traumatized anterior Teeth – Hargreaves.

16. PUBLIC HEALTH DENTISTRY

GOAL:

To prevent and control oral diseases and promote oral health through organized community efforts

OBJECTIVES:

Knowledge:

At the conclusion of the course the student shall have a knowledge of the basis of public health, preventive dentistry, public health problems in India, Nutrition, Environment and their role in health, basics of dental statistics, epidemiological methods, National oral health policy with emphasis on oral health policy.

Skill and Attitude:

At the conclusion of the course the students shall have require at the skill of identifying health problems affecting the society, conducting health surveys, conducting health education classes and deciding health strategies. Students should develop a positive attitude towards the problems of the society and must take responsibilities in providing health.

Communication abilities:

At the conclusions of the course the student should be able to communicate the needs of the community efficiently, inform the society of all the recent methodologies in preventing oral disease

Syllabus:

1. Introduction to Dentistry: Definition of Dentistry, History of dentistry, Scope, aims and objectives of Dentistry.
2. Public Health:
   - i. Health & Disease: - Concepts, Philosophy, Definition and Characteristics
   - ii. Public Health: - Definition & Concepts, History of public health
   - iii. General Epidemiology: - Definition, objectives, methods
   - iv. Environmental Health: - Concepts, principles, protection, sources, purification environmental sanitation of water disposal of waste sanitation, then role in mass disorder
   - v. Health Education: - Definition, concepts, principles, methods, and health education aids
   - vi. Public Health Administration: - Priority, establishment, manpower, private practice management, hospital management.
   - vii. Ethics and Jurisprudence: Professional liabilities, negligence, malpractice, consents, evidence, contracts, and methods of identification in forensic dentistry.
   - viii. Nutrition in oral diseases
   - ix. Behavioral science: Definition of sociology, anthropology and psychology and their in dental practice and community.
   - x. Health care delivery system: Center and state, oral health policy, primary health care, national programmes, health organizations.

Dental Public Health:

1. Definition and difference between community and clinical health.
2. Epidemiology of dental diseases-dental caries, periodontal diseases, malocclusion, dental fluorosis and oral cancer.
3. Survey procedures: Planning, implementation and evaluation, WHO oral health survey methods 1997, indices for dental diseases.

4. Delivery of dental care: Dental auxiliaries, operational and non-operational, incremental and comprehensive health care, school dental health.
5. Payments of dental care: Methods of payments and dental insurance, government plans
6. Preventive Dentistry- definition, Levels, role of individual , community and profession, fluorides in dentistry, plaque control programmes.

Research Methodology and Dental Statistics

1. Health Information: - Basic knowledge of Computers, MS Office, Window 2000, Statistical Programmes
2. Research Methodology: -Definition, types of research, designing a written protocol
3. Bio-Statistics: - Introduction, collection of data, presentation of data, Measures of Central tendency, measures of dispersion, Tests of significance, Sampling and sampling techniques-types, errors, bias, blind trails and calibration.

Practice Management

1. Place and locality
2. Premises & layout
3. Selection of equipments
4. Maintenance of records/accounts/audit.

Dentist Act 1948 with amendment.
Dental Council of India and State Dental Councils
Composition and responsibilities.
Indian Dental Association
Head Office, State, local and branches.

PRACTICALS/CLINICALS/FIELD PROGEAMME IN COMMUNITY DENTISTRY:
These exercises designed to help the student in IV year students:

1. Understand the community aspects of dentistry
2. To take up leadership role in solving community oral health programme

Exercises:

a) Collection of statistical data (demographic) on population in India, birth rates, morbidity and mortality, literacy, per capita income
b) Incidence and prevalence of common oral diseases like dental caries, periodontal disease, oral cancer, fluorosis at national and international levels
c) Preparation of oral health education material posters, models, slides, lectures, play acting skits etc.
d) Oral health status assessment of the community using indices and WHO basic oral health survey methods
e) Exploring and planning setting of private dental clinics in rural, semi urban and urban locations, availment of finances for dental practices-preparing project report.
f) Visit to primary health center-to acquaint with activities and primary health care delivery
g) Visit to water purification plant/public health laboratory/ center for treatment of western and sewage water
h) Visit to schools-to assess the oral health status of school children, emergency treatment and health education including possible preventive care at school (tooth brushing technique demonstration and oral rinse programme etc.)
i) Visit to institution for the care of handicapped, physically, mentally, or medically compromised patients
j) Preventive dentistry: in the department application of pit and fissure sealants, fluoride gel application procedure, A. R. T., Comprehensive health for 5 pts at least 2 patients

The colleges are encouraged to involve in the N.S.S. programme for college students for carrying out social work in rural areas

SUGGESTED INTERNSHIP PROGRAMME IN COMMUNITY DENTISTRY:

I. AT THE COLLEGE:

Students are posted to the department to get training in dental practice management.

(a) Total oral health care approach- in order to prepare the new graduates in their approach to diagnosis, treatment planning, cost of treatment, prevention of treatment on schedule, recall maintenance of records etc. at least 10 patients (both children and adults of all types posting for at least one month).
(b) The practice of chair side preventive dentistry including oral health education

II. AT THE COMMUNITY ORAL HEALTH CARE CENTRE (ADOPTED BY THE DENTAL COLLEGE IN RURAL AREAS)

Graduates posted for at least on month to familiarize in:

(a) Survey methods, analysis and presentation of oral health assessment of school children and community independently using WHO basic oral health survey methods.
(b) Participation in rural oral health education programmes
(c) Stay in the village to understand the problems and life in rural areas

III. DESIRABLE: Learning use of computers-at least basic programme.

Examination Pattern

I. Index: Case History

b) Oral hygiene indices simplified- Green and Vermilion
c) Silness and Loe index for Plaque
d) Loe and Silness index for gingival
e) CPI
f) DMF: T and S, df:t and s
g) Deans fluoride index

II. Health Education
1. Make one - Audio visual aid
2. Make a health talk

III. Practical work
1. Pit and fissure sealant
2. Topical fluoride application

BOOKS RECOMMENDED & REFERENCE:

1. Dentistry Dental Practice and Community by David F. Striffler and Brain A. Burt, Edn. –1983, W. B. Saunders Company
2. Principles of Dental Public Health by James Morse Dunning, IVth Edition, 1986, Harward University Press.
3. Dental Public Health and Community Dentistry Ed by Anthony Jong Publication by The C. V. Mosby Company 1981
4. Community Oral Health-A system approach by Patricia P. Cormier and Joyce I. Levy published by Appleton-Century-Crofts/New York, 1981
5. Community Dentistry-A problem oriented approach by P. C. Dental Hand book series Vol.8 by Stephen L. Silverman and Ames F. Tryon, Series editor-Alvin F. Gardner, PSG Publishing company Inc. Littleton Massachuseltts, 1980.
6. Dental Public Health- An Introduction to Community Dentistry. Edition by Geoffrey L. Slack and Brain Burt, Published by John Wrigth and sons Bristol, 1980
7. Oral Health Surveys- Basic Methods, 4th edition, 1997, published by W. H. O. Geneva available at the regional office New Delhi.
8. Preventive Medicine and Hygiene-By Maxcy and Rosenau, published by Appleton Century Crofts, 1986.
9. Preventive Dentistry-by J. O. Forrest published by John Wright and sons Bristoli, 1980.
10. Preventive Dentistry by Murray, 1997.
11. Text Book of Preventive and Social Medicine by Park and park, 14th edition.
12. Community Dentistry by Dr. Soben Peter.
13. Introduction to Bio-statistics by B. K. Mahajan
14. Research methodology and Bio-statistics by
15. Introduction to Statistical Methods by Grewal

17. PERIODONTOLOGY

OBJECTIVES:

The student shall acquire the skill to perform dental scaling ,diagnostic tests of periodontal diseases; to use the instruments for periodontal therapy and maintenance of the same.

The student shall develop attitude to impart the preventive measures namely, the prevention of periodontal diseases and prevention of the progress of the disease. The student shall also develop an attitude to perform the treatment with full aseptic precautions; shall develop an attitude to prevent iatrogenic diseases; to conserve the tooth to the maximum possible time by maintaining periodontal health and to refer the patients who require specialist's care.

1. Introduction: Definition of Periodontology, Periodontics, Periodontia, Brief historical background, Scope of Periodontics
2. Development of perio-dontal tissues, micro-structural anatomy and biology of periodontal tissues in detail Gingiva. Junctional epithelium in detail, Epithelial-Mesenchymal interaction,Periodontal, ligament Cementum, Alveolar bone.
3. Defensive mechanisms in the oral cavity: Role of-Epithelium,Gingival fluid, Saliva and other defensive mechanisms in the oral environment.

4.	Age changes in periodontal structures and their significance in Geriatric dentistry	Age changes in teeth and periodontal structures and their association with periodontal diseases	1
5.	Classification of periodontal diseases	Need for classification, Scientific basis of classification Classification of gingival and periodontal diseases as described in World Workshop1989 Gingivitis: Plaque associated,ANUG,steroid hormone influenced, Medication influenced, Desquamative gingivitis, other forms of gingivitis as in nutritional deficiency, bacterial and viral infections etc.	1

		Periodontitis: Adult periodontitis, Rapidly progressive periodontitis A&B, Juvenile periodontitis(localized, generalized, and post-juvenile), Prepubertal periodontitis, Refractory periodontitis	
6.	Gingival diseases	Localized and generalized gingivitis, Papillary, marginal and diffuse gingivitis Etiology, pathogenesis, clinical signs, symptoms and management of i) Plaque associated gingivitis ii) Systemically aggravated gingivitis(sex hormones, drugs and systemic diseases) iii) ANUG iv) Desquamative gingivitis-Gingivitis associated with lichen planus, pemphigoid, pemphigus, and other vesiculobullous lesions v) Allergic gingivitis vi) Infective gingivitis-Herpetic, bacterial and candidial vii) Pericoronitis viii) Gingival enlargement (classification and differential diagnosis)	6
7	Epidemiology of periodontal diseases	- Definition of index, incidence, prevalence,epidemiology,endemic, epidemic, and pandemic - Classification of indices(Irreversible and reversible) - Deficiencies of earlier indices used in Periodontics - Detailed understanding of Silness &Loe Plaque Index ,Loe&Silness Gingival Index, CPITN &CPI. - Prevalence of periodontal diseases in India and other countries. - Public health significance(All these topics are covered at length under community dentistry. Hence, the topics may be discussed briefly. However, questions may be asked from the topics for examination	2
8.	Extension of inflammation from gingiva	Mechanism of spread of inflammation from gingival area to deeper periodontal structures Factors that modify the spread	1
9.	Pocket	Definition, signs and symptoms, classification, pathogenesis, histopathology, root surface changes and contents of the pocket	2
10.	Etiology	- Dental Plaque (Biofilm) - Definition, New concept of biofilm - Types, composition, bacterial colonization, growth,maturation &disclosing agents - Role of dental plaque in periodontal diseases - Plaque microorganisms in detail and bacteria associated with periodontal diseases - Plaque retentive factors - Materia alba - Food debris - Calculus - Definition - Types, composition, attachment, theories of formation - Role of calculus in disease Food Impaction - Definition - Types, Etiology - Hirschfelds' classification - Signs ,symptoms &sequelae of treatment Trauma from occlusion - Definition, Types - Histopathological changes - Role in periodontal disease - Measures of management in brief Habits - Their periodontal significance - Bruxism &parafunctional habits, tongue thrusting ,lip biting, occupational habits IATROGENIC FACTORS	5

		Conservative Dentistry - Restorations - Contact point, marginal ridge, surface roughness, overhanging restorations, interface between restoration and teeth Prosthodontics - Interrelationship - Bridges and other prosthesis, pontics(types) ,surface contour, relationships of margins to the periodontium, Gingival protection theory, muscle action theory& theory of access to oral hygiene. Orthodontics - Interrelationship, removable appliances &fixed appliances - Retention of plaque, bacterial changes Systemic diseases - Diabetes, sex hormones, nutrition(Vit.C &proteins) - AIDS & periodontium - Hemorrhagic diseases, Leukemia, clotting factor disorders,PMN disorders	
11.	Risk factors	Definition. Risk factors for periodontal diseases	1
12.	Host response	- Mechanism of initiation and progression of periodontal diseases - Basic concepts about cells, Mast cells, neutrophils, macrophages, lymphocytes, immunoglobulins, complement system, immune mechanisms & cytokines in brief - Stages in gingivitis-Initial, early, established & advanced - Periodontal disease activity, continuous paradigm, random burst & asynchronous multiple burst hypothesis	3
13.	Periodontitis	- Etiology ,histopathology, clinical signs & symptoms, diagnosis and treatment of adult periodontitis - Periodontal abscess; definition, classification, pathogenesis, differential diagnosis and treatment - Furcation involvement, Glickmans' classification, prognosis and management - Rapidly progressive periodontitis - Juvenile periodontitis: Localized and generalized - Post-juvenile periodontitis - Periodontitis associated with systemic diseases - Refractory periodontitis	6
14.	Diagnosis	- Routine procedures, methods of probing, types of probes,(According to case history) - Halitosis: Etiology and treatment. Mention advanced diagnostic aids and their role in brief.	2
15.	Prognosis	- Definition, types, purpose and factors to be taken into consideration	1
16.	Treatment plan	- Factors to be considered	1
17.	Periodontal therapy	A. General principles of periodontal therapy. Phase I,II, III, IV therapy. Definition of periodontal regeneration, repair, new attachment and reattachment. B. Plaque control i. Mechanical tooth brushes, interdental cleaning aids, dentifrices ii. Chemical; classification and mechanism of action of each & pocket irrigation	3
18.	Pocket eradication procedures	- Scaling and root planing: - Indications - Aims & objectives - Healing following root planning - Hand instruments, sonic, ultrasonic &piezo-electric scalers - Curettage &present concepts - Definition - Indications - Aims &objectives - Procedures & healing response - Flap surgery - Definition - Types of flaps, Design of flaps, papilla preservation	5

		- Indications & contraindications - Armamentarium - Surgical procedure & healing response	
9.	Osseous Surgery	Osseous defects in periodontal disease - Definition - Classification - Surgery: resective, additive osseous surgery (osseous grafts with classification of grafts) - Healing responses - Other regenerative procedures; root conditioning - Guided tissue regeneration	2
20.	Mucogingival surgery &periodontal plastic surgeries	Definition Mucogingival problems: etiology, classification of gingival recession (P.D.Miller Jr. and Sullivan and Atkins) Indications & objectives Gingival extension procedures: lateral pedicle graft, frenectomy, frenotomy Crown lengthening procedures Periodontal microsurgery in brief	3
21.	Splints	- Periodontal splints - Purpose & classification - Principles of splinting	1
22.	Hypersensitivity	Causes, Theories & management	1
23.	Implants	Definition, types, scope &biomaterials used. Periodontal considerations: such as implant-bone interface, implant-gingiva interface, implant failure, peri-implantitis & management	1
24.	Maintenance phase (SPT)	- Aims, objectives, and principles - Importance - Procedures - Maintenance of implants	1
25.	Pharmaco-therapy	- Periodontal dressings - Antibiotics & anti-inflammatory drugs - Local drug delivery systems	2
26.	Periodontal management of medically compromised patients	Topics concerning periodontal management of medically compromised patients	1
27.	Inter-disciplinary care	- Pulpo-periodontal involvement - Routes of spread of infection - Simons' classification - Management	1
28.	Systemic effects of periodontal diseases in brief	Cardiovascular diseases, Low birth weight babies etc.	1
29.	Infection control protocol	Sterilization and various aseptic procedures	1
30.	Ethics		

<u>TUTORIALS DURING CLINICAL POSTING</u>;

1. Infection control
2. Periodontal instruments
3. Chair position and principles of instrumentation
4. Maintenance of instruments (sharpening)
5. Ultrasonic, Piezoelectric and sonic scaling – demonstration of technique
6. Diagnosis of periodontal disease and determination of prognosis
7. Radiographic interpretation and lab investigations
8. Motivation of patients- oral hygiene instructions

Students should be able to record a detailed periodontal case history, determine diagnosis, prognosis and plan treatment. Student should perform scaling, root planning local drug delivery and SPT. Shall be given demonstration of all periodontal surgical procedures.

DEMONSTRATIONS:

1. History taking and clinical examination of the patients
2. Recording different indices
3. Methods of using various scaling and surgical instruments
4. Polishing the teeth
5. Bacterial smear taking
6. Demonstration to patients about different oral hygiene aids

7. Surgical procedures- gingivectomy, gingivoplasty, and flap operations
8. Follow up procedures, post operative care and supervision

REQUIREMENTS:

1. Diagnosis, treatment planning and discussion and total periodontal treatment – 25 cases
2. Dental scaling, oral hygiene instructions – 50 complete cases/ equivalent
3. Assistance in periodontal surgery – 5 cases
4. A work record should be maintained by all the students and should be submitted at the time of examination after due certification from the head of the department.

Students should have to complete the work prescribed by the concerned department from time to time and submit a certified record for evaluation.

PRESCRIBED BOOK:

1. Glickman's Clinical Periodontology — Carranza

REFERENCE BOOKS

1. Essentials of Periodontology and periodontics- Torquil MacPhee
2. Contemporary periodontics- Cohen
3. Periodontal therapy- Goldman
4. Orbans' periodontics- Orban
5. Oral Health Survey- W.H.O.
6. Preventive Periodontics- Young and Stiffler
7. Public Health Dentistry- Slack
8. Advanced Periodontal Disease- John Prichard
9. Preventive Dentistry- Forrest
10. Clinical Periodontology- Jan Lindhe
11. Periodontics- Baer & Morris.

18. PROSTHODONTICS AND CROWN & BRIDGE

Complete Dentures

A. Applied Anatomy and Physiology.
   1. Introduction
   2. Biomechanics of the edentulous state.
   3. Residual ridge resorption.

B. Communicating with the patient
   1. Understanding the patients.
      - Mental attitude.
   2. Instructing the patient.

C. Diagnosis and treatment planning for patients-
   1. With some teeth remaining.
   2. With no teeth remaining.
   a) Systemic status.
   b) Local factor.
   c) The geriatric patient.
   d) Diagnostic procedures.

D. Articulators- discussion

E. Improving the patient's denture foundation and ridge relation -an overview.
   a) Pre-operative examination.
   b) Initial hard tissue & soft tissue procedure.
   c) Secondary hard & soft tissue procedure.
   d) Implant procedure.
   e) Congenital deformities.
   f) Postoperative procedure.

F. Principles of Retention, Support and Stability

G. Impressions - detail.
   a) Muscles of facial expression.
   b) Biologic considerations for maxillary and mandibular impression including anatomy landmark and their interpretation.
   c) Impression objectives.
   d) Impression materials.
   e) Impression techniques.
   f) Maxillary and mandibular impression procedures.
   i. Preliminary impressions.
   ii. Final impressions.
   g) Laboratory procedures involved with impression making (Beading & Boxing, and cast preparation).

H. Record bases and occlusion rims- in detail.
   a) Materials & techniques.
   b) Useful guidelines and ideal parameters.
   c) Recording and transferring bases and occlusal rims.

I. Biological consideration in jaw relation & jaw movements - craniomandibular relations.
   a) Mandibular movements.
   b) Maxillo -mandibular relation including vertical and horizontal jaw relations.
   c) Concept of occlusion- discuss in brief.

J. Relating the patient to the articulator.
   a) Face bow types & uses– discuss in brief.
   b) Face bow transfer procedure - discuss in brief.

K. Recording maxillo mandibular relation.
   a) Vertical relations.
   b) Centric relation records.
   c) Eccentric relation records.
   d) Lateral relation records.

L. Tooth selection and arrangement.
   a) Anterior teeth.
   b) Posterior teeth.
   c) Esthetic and functional harmony.

M. Relating inclination of teeth to concept of occlusion- in brief.
   a) Neutrocentric concept.
   b) Balanced occlusal concept.

N. Trial dentures.

O. Laboratory procedures.
   a) Wax contouring.
   b) Investing of dentures.
   c) Preparing of mold.
   d) Preparing & packing acrylic resin.
   e) Processing of dentures.
   f) Recovery of dentures.
   g) Lab remount procedures.
   h) Recovering the complete denture from the cast.
   i) Finishing and polishing the complete denture.
   j) Plaster cast for clinical denture remount procedure.

P. Denture insertion.
   a) Insertion procedures.
   b) Clinical errors.
   c) Correcting occlusal disharmony.
   d) Selective grinding procedures.

R. Treating problems with associated denture use – discuss in brief (tabulation/flow-chart form).

S. Treating abused tissues - discuss in brief.

T. Relining and rebasing of dentures- discuss in brief.

V. Immediate complete dentures construction procedure- discuss in brief.

W. The single complete denture- discuss in brief.

X. Overdentures denture- discuss in brief.

Y. Dental implants in complete denture - discuss in brief.

Note : It is suggested that the above mentioned topics be dealt with wherever appropriate in the following order so as to cover –

1. Definition
2. Diagnosis (of the particular situation/patient selection/treatment planning)
3. Types / Classification
4. Materials
5. Methodology – Lab /Clinical
6. Advantages & disadvantages
7. Indications, contraindications
8. Maintenance Phase
9. Oral Implantology
10. Ethics

Removable Flexible Dentures

1. Introduction
   - Terminologies and scope
2. Classification.
3. Examination, Diagnosis & Treatment planning & evaluation of diagnostic data.
4. Components of a removable partial denture.
   - Major connectors,
   - minor connectors,
   - Rest and rest seats.
5. Components of a Removable Partial Denture.
   - Direct retainers,
   - Indirect retainers,
   - Tooth replacement.

6. Principles of Removable Partial Denture Design.
7. Survey and design – in brief.
   - Surveyors.
   - Surveying.
   - Designing.
8. Mouth preparation and master cast.
9. Impression materials and procedures for removable partial dentures.
10. Preliminary jaw relation and esthetic try-in for some anterior replacement teeth.
11. Laboratory procedures for framework construction-in brief.
12. Fitting the framework - in brief.
13. Try-in of the partial denture - in brief.
14. Completion of the partial denture - in brief.
15. Inserting the Removable Partial Denture - in brief.
16. Postinsertion observations.
17. Temporary Acrylic Partial Dentures.
18. Immediate Removable Partial Denture.
19. Removable Partial Dentures opposing Complete denture.

Note : It is suggested that the above mentioned topics be dealt with wherever appropriate in the following order so as to cover –

1. Definition
2. Diagnosis (of the particular situation /patient selection /treatment planning)
3. Types / Classification
4. Materials
5. Methodology – Lab /Clinical
6. Advantages & disadvantages
7. Indications, contraindications
8. Maintenance Phase

Fixed Partial Dentures

Topics To Be Covered In Detail -

1. Introduction
2. Fundamentals of occlusion – in brief.
3. Articulators – in brief.
4. Treatment planning for single tooth restorations.
5. Treatment planning for the replacement of missing teeth including selection and choice of abutment teeth.
6. Fixed partial denture configurations.
7. Principles of tooth preparations.
8. Preparations for full veneer crowns – in detail.
9. Preparations for partial veneer crowns – in brief.
10. Provisional Restorations
11. Fluid Control and Soft Tissue Management
12. Impressions
13. Working Casts and Dies
14. Wax Patterns
15. Pontics and Edentulous Ridges
16. Esthetic Considerations
17. Finishing and Cementation

Topics To Be Covered In Brief -

1. Solder Joints and Other Connectors
2. All - Ceramic Restorations
3. Metal - Ceramic Restorations
4. Preparations of intracoronal restorations.
5. Preparations for extensively damaged teeth.
6. Preparations for periodontally weakened teeth
7. The Functionally Generated Path Technique
8. Investing and Casting
9. Resin - Bonded Fixed Partials Denture

Note : It is suggested that the above mentioned topics be dealt with wherever appropriate in the following order so as to cover –

1. Definition
2. Diagnosis(of the particular situation /patient selection /treatment planning)
3. Types / Classification
4. Materials
5. Methodology – Lab /Clinical
6. Advantages & disadvantages
7. Indications, contraindications
8. Maintenance Phase

RECOMMENDED BOOKS:
1. Syllabus of Complete denture by - Charles M. Heartwell Jr. and Arthur O. Rahn.
2. Boucher's "Prosthodontic treatment for edentulous patients"
3. Essentials of complete denture prosthodontics by – Sheldon Winkler.
4. Maxillofacial prosthetics by – Willam R.Laney.
5. McCraken's Removable partial prosthodontics
6. Removable partial prosthdontics by – Ernest L. Miller and Joseph E. Grasso.

19. AESTHETIC DENTISTRY

Aesthetic Dentistry is gaining more popularity since last decade. It is better that undergraduate students should understand the philosophy and scientific knowledge of the esthetic dentistry.

1. Introduction and scope of esthetic dentistry
2. Anatomy & physiology of smile
3. Role of the colour in esthetic dentistry
4. Simple procedures (roundening of central incisors to enhance esthetic appearance)
5. Bleaching of teeth
6. Veneers with various materials
7. Prevedntive and interceptive esthetics
8. Ceramics
9. Simple gingival contouring to enhance the appearance
10. Simple clinical procedures for BDS students

Recommended books:
1. Esthetic guidelines for restorative dentistry; Scharer & others
2. Esthetics of anterior fixed prosthodontics; Chiche (GJ) & Pinault (Alain)
3. Esthetic & the treatment of facial form, Vol 28; Mc Namara (JA)

20. FORENSIC ODONTOLOGY (30 hrs of instruction)

Definition
Forensic is derived from the Latin word forum, which means 'court of law.' Odontology literally implies 'the study of teeth.' Forensic odontology, therefore, has been defined by the Fédération Dentaire International (FDI) as "that branch of dentistry which, in the interest of justice, deals with the proper handling and examination of dental evidence, and with the proper evaluation and presentation of dental findings."

Objectives of the undergraduate curriculum

At the end of the programme, the dental graduate should:

1. Have sound knowledge of the theoretical and practical aspects of forensic odontology.
2. Have an awareness of ethical obligations and legal responsibilities in routine practice and forensic casework.
3. Be competent to recognise forensic cases with dental applications when consulted by the police, forensic pathologists, lawyers and associated professionals.
4. Be competent in proper collection of dental evidence related to cases of identification, ethnic and sex differentiation, age estimation and bite marks.
5. Be able to assist in analysis, evaluation, and presentation of dental facts within the realm of law.

Curriculum for forensic odontology
1. Introduction to forensic dentistry
   - Definition and history
   - Recent developments and future trends
2. Overview of forensic medicine and toxicology
   - Cause of death and postmortem changes
   - Toxicological manifestations in teeth and oral tissues
3. Dental identification
   - Definition
   - Basis for dental identification
   - Postmortem procedures
   - Dental record compilation and interpretation
   - Comparison of data, and principles of report writing
   - Identification in disasters and handling incinerated remains
   - Postmortem changes to oral structures
4. Maintaining dental records
   - Basic aspects of good record-keeping
   - Different types of dental records
     - Dental charts
     - Dental radiographs
     - Study casts
     - Denture marking
     - Photographs

- Dental notations
- Relevance of dental records in forensic investigation

5. Age estimation
   - Age estimation in children and adolescents
     - Advantages of tooth calcification over 'eruption' in estimating age
     - Radiographic methods of Schour & Massler, Demirjian et al
   - Age estimation in adults
     - Histological methods – Gustafson's six variables and Johanson's modification, Bang & Ramm's dentine translucency
     - Radiographic method of Kvaal et al
   - Principles of report writing
6. Sex differentiation
   - Sexual dimorphism in tooth dimensions (Odontometrics)
7. Ethnic variations ('racial' differences) in tooth morphology
   - Description of human population groups
   - Genetic and environmental influences on tooth morphology
   - Description of metric and non-metric dental features used in ethnic differentiation
8. Bite mark procedures
   - Definition and classification
   - Basis for bite mark investigation
   - Bite mark appearance
   - Macroscopic and microscopic ageing of bite marks
   - Evidence collection from the victim and suspect of bite mark
   - Analysis and comparison
   - Principles of report writing
   - Animal bite investigation
9. Dental DNA methods
   - Importance of dental DNA evidence in forensic investigations
   - Types of DNA and dental DNA isolation procedures
   - DNA analysis in personal identification
   - Gene-linked sex dimorphism
   - Population genetics
10. Jurisprudence and ethics
    - Fundamentals of law and the constitution
    - Medical legislation and statutes (Dental and Medical Council Acts, etc)
    - Basics of civil law (including torts, contracts and consumer protection act)
    - Criminal and civil procedure code (including expert witness requirement)
    - Assessment and quantification of dental injuries in courts of law
    - Medical negligence and liability
    - Informed consent and confidentiality
    - Rights and duties of doctors and patients
    - Medical and dental ethics (as per Dentists' Act)

Theory sessions and practical exercises

Total hours for the course

- Didactic – 10-12 hours
- Practical – 20-25 hours

Detailed didactic sessions for the above components, either in the form of lectures or as structured student-teacher interactions, is essential. Specialists from multiple disciplines, particularly from legal and forensic sciences, can be encouraged to undertake teaching in their area of expertise.

An interactive, navigable and non-linear (INN) model may also be utilised for education.

Practical exercises (real-life casework and/or simulated cases) must complement didactic sessions to facilitate optimal student understanding of the subject. Mandatory practical training in dental identification methods, dental profiling (ethnic and sex differences, radiographic age estimation), and bite mark procedures, is of paramount importance. In addition, practical exercises/demonstrations in histological age estimation, comparative dental anatomy, DNA methods, medical autopsy, court visits, and other topics may be conducted depending on available expertise, equipment and feasibility.

Approach to teaching forensic odontology

Forensic odontology could be covered in two separate streams. The divisions include a preclinical stream and a clinical stream.

Preclinical stream

- Introduction to forensic odontology
- Sex differences in odontometrics
- Ethnic variations in tooth morphology
- Histological age estimation
- Dental DNA methods

- Bite marks procedures
- Overview of forensic medicine and toxicology

It could prove useful to undertake the preclinical stream in II or III year under Oral Biology/Oral Pathology since these aspects of forensic odontology require grounding in dental morphology, dental histology and basic sciences, which, students would have obtained in I and/or II BDS.

Clinical stream

- Dental identification
- Maintaining dental records
- Radiographic age estimation
- Medical jurisprudence and ethics

It would be suitable to undertake these topics in the IV or V year as part of Oral Medicine and Radiology, since students require reasonable clinical exposure and acumen to interpret dental records, perform dental postmortems and analyse dental radiographs for age estimation.

21. ORAL IMPLANTOLOGY (30 hrs of instruction)

INTRODUCTION TO ORAL IMPLANTOLOGY

Oral Implantology is now emerged as a new branch in dentistry world wide and it has been given a separate status in the universities abroad. In India day to day the practice of treating patients with implants are on rise. In this contest inclusion of this branch into under graduate curriculum has become very essential. The objective behind this is to impart basic knowledge of Oral Implantology to undergraduates and enable them to diagnose, plan the treatment and to carry out the needed pre surgical mouth preparations and treat or refer them to speciality centres. This teaching programme may be divided and carried out by the Dept. of Oral Surgery, Prosthodontics and Periodontics.

1. History of implants, their design & surface characteristics and osseo-integration
2. Scope of oral & maxillofacial implantology & terminologies
3. A brief introduction to various implant systems in practice
4. Bone biology, Morphology, Classification of bone and its relevance to implant treatment and bone augmentation materials.
5. Soft tissue considerations in implant dentistry
6. Diagnosis & treatment planning in implant dentistry
   Case history taking/Examination/Medical evaluation/Orofacial evaluation/ Radiographic evaluation/ Diagnostic evaluation/ Diagnosis and treatment planning/ treatment alternatives/ Estimation of treatment costs/ patient education and motivation
7. Pre surgical preparation of patient
8. Implant installation & armamentarium for the Branemark system as a role model
9. First stage surgery – Mandible – Maxilla
10. Healing period & second stage surgery
11. Management of surgical complications & failures
12. General considerations in prosthodontic reconstruction & Bio mechanics
13. Prosthodontic components of the Branemark system as a role model
14. Impression procedures & Preparation of master cast
15. Jaw relation records and construction of suprastructure with special emphasis on occlusion for osseointegrated prosthesis
16. Management of prosthodontic complications & failures
17. Recall & maintenance phase.

Criteria for success of osseointegrated implant supported prosthesis

SUGGESTED BOOKS FOR READING

1. Contemporary Implant Dentistry - Carl .E. Misch
   Mosby 1993 First Edition.
2. Osseointegration and Occlusal Rehabilitation Hobo S., Ichida. E. and
   Garcia L.T.
   Quintessence Publishing Company, 1989 First Edition.

22. BEHAVIOURAL SCIENCES (20 hrs of instruction)

GOAL:

The aim of teaching behavioural sciences to undergraduate student is to impart such knowledge & skills that may enable him to apply principles of behaviour –

a) For all round development of his personality
b) In various therapeutic situations in dentistry.

The student should be able to develop skills of assessing psychological factors in each patient, explaining stress, learning simple counselling techniques, and improving patients compliance behaviour.

OBJECTIVES:

A) KNOWLEDGE & UNDERSTANDING:

At the end of the course, the student shall be able to:

1) Comprehend different aspects of normal behaviour like learning, memory, motivation, personality & intelligence.
2) Recognise difference between normal and abnormal behaviour.
3) Classify psychiatric disorders in dentistry.
4) Recognise clinical manifestations of dental phobia, dental anxiety, facial pain, orofacial manifestations of psychiatric disorders, and behavioural problems in children. Addictive disorders, psychological disorders in various dental departments.
5) Should have understanding of stress in dentistry and knowledge of simple counselling techniques.
6) Have some background knowledge of interpersonal, managerial and problem solving skills which are an integral part of modern dental practice.
7) Have knowledge of social context of dental care.

B) SKILLS

The student shall be able to:

1) Interview the patient and understand different methods of communication skills in dentist - patient relationship.
2) Improve patients compliance behaviour.
3) Develop better interpersonal, managerial and problem solving skills.
4) Diagnose and manage minor psychological problems while treating dental patients.

INTEGRATION:

The training in Behavioural sciences shall prepare the students to deliver preventive, promotive, curative and rehabilitative services to the care of the patients both in family and community and refer advanced cases to specialised psychiatric hospitals.

Training should be integrated with all the departments of Dentistry, Medicine, Pharmacology, Physiology and Biochemistry.

PSYCHOLOGY:

1. Definition & Need of Behavioural Science. Determinants of Behaviour. Hrs 1 Scope of Behavioural Science.
2. Sensory process & perception perceptual process- clinical applications.
3. Attention - Definition - factors that determine attention. Clinical application.
4. Memory - Memory process - Types of memory , Forgetting:
   Methods to improve memory, Clinical assessment of memory & clinical applications.
5. Definition - Laws of learning
   Type of learning. Classical conditioning, operant conditioning, cognitive learning, Insight learning, social learning, observational learning, principles of learning– Clinical application.
6. Intelligence- Definition: Nature of intelligencestability of intelligence
   Determinants of intelligence, clinical application
7. Thinking - Definition: Types of thinking, delusions, problem solving
8. Motivation - Definition: Motive, drive, needs classification of motives
9. Emotions - Definition differentiation from feelings – Role of hypothalamus, Cerebral cortex, adrenal glands ANS. Theories of emotion, Types of emotions.
   Personality. Assessment of personality: Questionnaires, personality inventory, rating scales, Interview projective techniques – Rorshach ink blot test , RAT, CAT

SOCIOLOGY:

Social class, social groups – family, types of family, types of marriages, communities and Nations and institutions.

REFERENCE BOOKS:

1. General psychology -- S.K. Mangal
2. General psychology -- Hans Raj, Bhatia
3. General psychology -- Munn
4. Behavioural Sciences in Medical practise -- Manju Mehta
5. Sciences basic to psychiatry -- Basanth Puri & Peter J Tyrer

23. ETHICS (20 hrs. of instruction)

Introduction:

There is a definite shift now from the traditional patient and doctor relationship and delivery of dental care. With the advances in science and technology and the increasing needs of the patient, their families and community, there is a concern for the health of the community as a whole. There is a shift to greater accountability to the society. Dental specialists like the other health professionals are confronted with many ethical problems. It is therefore absolutely necessary for each and every one in the health care delivery to prepare themselves to deal with these problems. To accomplish this and

develop human values Council desires that all the trainees undergo ethical sensitization by lectures or discussion on ethical issues, discussion of cases with an important ethical component.

Course content:

Introduction to ethics –

- what is ethics?
- What are values and norms?
- How to form a value system in one's personal and professional life?
- Hippocratic oath.
- Declaration of Helsinki, WHO declaration of Geneva, International code of ethics, DCI Code of ethics.

Ethics of the individual –

The patient as a person.
Right to be respected
Truth and confidentiality
Autonomy of decision
Doctor Patient relationship

Profession Ethics –

Code of conduct
Contract and confidentiality
Charging of fees, fee splitting
Prescription of drugs
Over-investigating the patient
Malpractice and negligence

Research Ethics –

Animal and experimental research/humanness
Human experimentation
Human volunteer research-informed consent
Drug trials

Ethical workshop of cases
Gathering all scientific factors
Gathering all value factors
Identifying areas of value – conflict, setting of priorities
Working our criteria towards decisions

Recommended Reading:

Medical Ethics, Francis C.M., I Ed. 1993, Jaypee Brothers, New Delhi p. 189.

Annexure-A

DENTAL COUNCIL OF INDIA
Revised Internship Programme, 2011

CURRICULUM OF DENTAL INTERNSHIP PROGRAMME.

1. The duration of Internship shall be one year.
2. All parts of internship shall be done in a Dental College duly recognized/approved by the Dental Council of India for the purpose of imparting education and training to Dental graduates in the country.
3. The Internss shall be paid stipendiary allowance during the period of an Internship not extending beyond a period of one year.
4. The internship shall be compulsory and rotating as per the regulations prescribed for the purpose.
5. The degree- BDS shall be granted after completion of internship.

Determinants of Curriculum for internship for Dental Graduates:

The curricular contents of internship training shall be based on.

i) Dental health needs of the society.
ii) Financial, material and manpower resources available for the purpose.
iii) National Dental Health Policy.
iv) Socio-economic conditions of the people in general.
v) Existing Dental as also the primary health care concept, for the delivery of health services.
vi) Task analysis of what graduates in Dentistry in various practice settings, private and government service actually perform.
vii) Epidemiological studies conducted to find out prevalence of different dental health problems, taking into consideration the magnitude of dental problems, severity of dental problems and social disruption caused by these problems.

Objectives:

A. To facilitate reinforcement of learning and acquisition of additional knowledge:-
   a) Reinforcement of knowledge.
   b) Techniques & resources available to the individual and the community; Social and cultural setting.
   c) Training in a phased manner, from a shared to a full responsibility.

B. To facilitate the achievement of basic skills: attaining competence Vs. maintaining competence in:-
   i) History taking.
   ii) Clinical Examination.
   iii) Performance and interpretation of essential laboratory data.
   iv) Data analysis and inference.
   v) Communication skills aimed at imparting hope and optimism in the patient.
   vi) Attributes for developing working relationship in the Clinical setting and Community team work.

C To facilitate development of sound attitudes and habits:-
   i) Emphasis on individual and human beings, and not on disease/symptoms.
   ii) Provision of comprehensive care, rather than fragmentary treatment.
   iii) Continuing Dental Education and Learning of accepting the responsibility.

D To facilitate understanding of professional and ethical principles:-
   - Right and dignity of patients.
   - Consultation with other professionals and referral to seniors/institutions.
   - Obligations to peers, colleagues, patients, families and Community.
   - Provision of free professional services in an emergent situation.

E To initiate individual and group action, leading to disease prevention and dental health promotion, at the level of individuals families and the community.

Content (subject matter)

The compulsory rotating paid Dental Internship shall include training in Oral Medicine & Radiology; Oral & Maxillofacial Surgery; Prosthodontics; Periodontics; Conservative Dentistry; Pedodontics; Oral Pathology & Microbiology; Orthodontics and Community Dentistry.

General Guidelines:

1. It shall be task-oriented training. The interns should participate in various institutional and field programmes and be given due responsibility to perform the activities in all departments of the Dental Colleges and associated Institutions.
2. To facilitate achievement of basic skills and attitudes the following facilities should be provided to all dental graduates:
   - i) History taking, examination, diagnosis, charting and recording treatment plan of cases.
   - ii) Presentation of cases in a group of Seminar.
   - iii) Care and sterilization of instruments used.
   - iv) Performance and interpretation of essential laboratory tests and other relevant investigations.
   - v) Data analysis and inference.
   - vi) Proper use of antibiotics, anti-inflammatory and other drugs, as well as other therapeutic modalities.
   - vii) Education of patients, their relatives and community on all aspects of dental health care while working in the institution as also in the field.
   - viii) Communication aimed at inspiring hope, confidence and optimism.
   - ix) Legal rights of patients and obligations of dental graduate under forensic jurisprudence.

1. **Oral Medicine & Radiology:**

1. Standardized examination of patients	25 Cases
2. Exposure to clinical, pathological laboratory procedures and biopsies.	5 Cases
3. Effective training in taking of Radiographs:	2 Full mouth
(Intra-oral) I.O. (Extra oral) E.O.	1
Cephalogram	1
4. Effective management of cases in wards	2 Cases

2. **Oral and Maxillofacial surgery**

A. The Interness during their posting in oral surgery shall perform the following procedures:

1. Extractions	50
2. Surgical extractions	2
3. Impactions	2
4 Simple Intra Maxillary Fixation	1
5 Cysts enucleations	1
6. Incision and drainage	2
7. Alveoloplasties, Biopsies & Frenectomies, etc.	3

B. The Interness shall perform the following on Cancer Patients:
   1. Maintain file work.
   2. Do extractions for radiotherapy cases.
   3. Perform biopsies.
   4. Observe varied cases of oral cancers.

C. The interness shall have 15 days posting in emergency services of a dental/general hospital with extended responsibilities in emergency dental care in the wards. During this period they shall attend to all emergencies under the direct supervision of oral surgeon during any operation:

1. **Emergencies.**
   (i) Toothache; (ii) trigemminal neuralgia; (iii) Bleeding from mouth due to trauma, post extraction, bleeding disorder or haemophylia; (iv) Airway obstruction due to fracture mandible and maxilla; dislocation of mandible; syncope or vasovagal attacks; ludwig's angina; tooth fracture; post intermaxillary fixation after general Anaesthesia.
2. Work in I.C.U. with particular reference to resuscitation procedures.
3. Conduct tutorials on medico-legal aspects including reporting on actual cases coming to casualty. They should have visits to law courts.

3. **Prosthodontics**

The dental graduates during their internship posting in Prosthodontics shall make:-

1.	Complete denture (upper & lower)	2
2.	Removable Partial Denture	4
3.	Fixed Partial Denture	1
4.	Planned cast partial denture	1
5.	Miscellaneous-like reline/overdenture/repairs of Maxillofacial Prosthesis	1
6.	Learning use of Face bow and Semi anatomic articulator technique	
7.	Crowns	
8.	Introduction of Implants	1

4. **Periodontics**

A. The dental graduates shall perform the following procedures

1.	Prophylaxis	15 Cases
2.	Flap Operation	2 Cases
3.	Root Planning	1 Case
4.	Currettage	1 Case
5.	Gingivectomy	1 Case
6.	Perio-Endo cases	1 Case

B. During their one week posting in the community health centers, the internss shall educate the public in prevention of Periodontal diseases.

5. **Conservative Dentistry**

To facilitate reinforcement of learning and achievement of basic skills, the interns shall perform atleast the following procedures independently or under the guidance of supervisors:

1.	Restoration of extensively mutilated teeth	5 Cases
2.	Inlay and onlay preparations	1 Case
3.	Use of tooth coloured restorative materials	4 Cases
4.	Treatment of discoloured vital and non-vital teeth	1 Case
5.	Management of dento alveolar fracture	1 Case
6.	Management of pulpless, single-rooted teeth without periapical lesion.	4 Cases
7.	Management of acute dento alveolar Infections	2 Cases
8.	Management of pulpless, single-rooted teeth with periapical lesion.	1 Case
9.	Non-surgical management of traumatised teeth during formative period.	

6. **Pedodontics and Preventive Dentistry**

During their posting in Pedodontics the Dental graduates shall perform:

1.	Topical application of fluorides including varnish	5 Cases
2.	Restorative procedures of carious deciduous teeth in children.	10 Cases
3.	Pulpotomy	2 Cases
4.	Pulpectomy	2 Cases
5.	Fabrication and insertion of space maintainers	1 Case

6. Oral habit breaking appliances — 1 Case

7. **Oral Pathology and Microbiology**

The interns shall perform the following:

1. History-recording and clinical examination — 5 Cases
2. Blood, Urine and Sputum examination — 5 Cases
3. Exfoliative Cytology and smears study — 2 Cases
4. Biopsy- Laboratory Procedure & reporting — 1 Case

8. **Orthodontics**

A. The interns shall observe the following procedures during their posting in Orthodontics:

1. Detailed diagnostic procedures for 5 patients
2. Laboratory techniques including wire-bending for removable appliances, soldering and processing of myo-functional appliances.
3. Treatment planning options and decisions.
4. Making of bands, bonding procedures and wire insertions.
5. Use of extra oral anchorage and observation of force values.
6. Retainers.
7. Observe handling of patients with oral habits causing malocclusions.

The dental graduates shall do the following laboratory work:-

1. Wire bending for removable appliances and space maintainers including weldoing and heat treatment procedure. - 5 Cases
2. Soldering exercises, banding & bonding procedures - 2 Cases
3. Cold-cure and heat-cure acrylisation of simple Orthodontic appliances - 5 Cases

9. **Public Health Dentistry**

1. The internss shall conduct health education sessions for individuals and groups on oral health public health nutrition, behavioral sciences, environmental health, preventive dentistry and epidemiology.
2. They shall conduct a short term epidemiological survey in the community, or I n the alternate, participate in the planning and methodology.
3. They shall arrange effective demonstrations of:
   a) Preventive and interceptive procedures for prevalent dental diseases.
   b) Mouth-rinsing and other oral hygiene demonstrations — 5 Cases
   c) Tooth brushing techniques — 5 Cases
4. Conduction of oral health education programmes at
   A) School setting — 2
   B) Community setting — 2
   C) Adult education programmes — 2
5. Preparation of Health Education materials — 5
6. Exposure to team concept and National Health Care systems:
   a) Observation of functioning of health infrastructure.
   b) Observation of functioning of health casre team including multipurpose workers male and female, health educators and other workers.
   c) Observation of atleast one National Health Programme:-
   d) Observation of interlinkages of delivery of oral health care with Primary Health care.

   Mobile dental clinics, as and when available, should be provided for this teachings.

10 **Elective Posting**

The Interns shall be posted for 15 days in any of the dental departments of their choice mentioned in the foregoing.

Organisation of content:

The Curriculum during the 4 years of BDS training is subject based with more emphasis on learning practical skills. During one year internship the emphasis will be on competency-based, community oriented training. The practical skills to be mastered by the interns along with the minimum performance level are given under the course content of different departments of Dental Education. The supervisors should seding it that proper facilities are provided in all departments and attached institutions for their performance.

Specification of teaching activities:

Didactic lectures are delivered during the four years training in BDS. These shall be voided during the internship programme. Emphasis shall be on chair-side teaching, small group teaching and discussions tutorials, seminars, ward posting, laboratory posting, field visits and self learning.

Use of Resource Materials:

Overhead projectors, slide projectors, film projectors, charts, diagrams, photographs, posters, specimens, models and other audiovisual aids shall be provided in all the Dental Colleges and attached institutions and field area. If possible, television, video and tapes showing different procedures and techniques to be mastered by the interns should be provided.

Evaluation

1. **Formative Evaluation:**

   Day-to-day assessment of the internss during their internship posting should be done.The objective ius that asll the interns must acquire necessary minimum skills required for carrying out day-to-day professional work competently. This can be achieved by maintaining records and performance data book by all internss. This will not only provide a demonstrable evidence; of the processes of training but more importantly, of the interns own acquisition of competencies as rolated to performance. It shall form a part of formative evaluation and shall also constitute a component of final grading of interns.

2. **Summative Evaluation:**

   It shall be based on the observation of the supervious of different departments and the records and performance data book maintained by the interns. Grading shall be done accordingly.

11. **Rural Services**

In the rural services, the student will have to participate in-

1. Community Health Monitoring programmes and services which include Preventive, Diagnostic and corrective procedures
2. To create educational awareness about dental hygiene and diseases.
3. Conduction of Oral Health Education Programmes at –
   (a) School Setting - 5
   (b) community Setting - 5
   (c) Adult Education Programme - 5
4. compulsory setup of satellite clinics in remote areas - 1
5. Lectures to create awareness and education in public forums about the harmful effects of tobacco consumption and the predisposition to oral cancer – two Lectures per student.

Period of Postings

1	Oral Medicine & Radiology	-	1 month
2	Oral & Maxillofacial Surgery	-	1 ½ months
3	Prosthodontics	-	1 ½ months
4	Periodontics	-	1 month
5	Conservative Dentistry	-	1 month
6	Pedodontics	-	1 month
7	Oral Pathology and Microbiology	-	15 days

8	Orthodontics	-	1 month
9	Community Dentistry/ Rural Services	-	3 months
10	Elective	-	15 days

[Published in the Gazette of India, Part III, Section 4.]

DENTAL COUNCIL OF INDIA

NOTIFICATION

New Delhi, dated 5th November, 2017.

No.DE-87-2017–In exercise of the powers conferred by clauses (g), (h) and (ha) of sub-section (2) of section 20 of the Dentists Act, 1948 (16 of 1948), the Dental Council of India, after consultation with the State Governments as required under clause (g) and (h) of the said Act, and in supersession of the Dental Council of India Revised MDS Course Regulations, 2007 except as respects things done or omitted to be done before such supersession, the Dental Council of India with the approval of the Central Government hereby makes the following regulations, namely:–

PART– I

PRELIMINARY

1. Short title and commencement.– (1) These regulations may be called the Dental Council of India, Master of Dental Surgery Course Regulations, 2017.

(2) They shall come into force on the date of their publication in the Official Gazette.

2. Definitions – In these regulations unless the context otherwise requires:-

(a) "Act" means the Dentists Act, 1948 (16 of 1948)
(b) "the Council" means the Dental Council of India constituted under section 3 of the Act;
(c) "dentistry" includes._
  (i) the performance of any operation on, and the treatment on any disease, deficiency or lesion of, human teeth or jaws, and the performance of radiographic work in connection with human teeth or jaws or the oral cavity;
  (ii) the giving of any anesthetic in connection with any such operation or treatment;
  (iii) the mechanical construction or the renewal of artificial dentures or restorative dental appliances;
  (iv) the performance of any operation on, or the giving of any treatment, advice or attendance to, any person preparatory to, or for the purpose of, or in connection with, the fitting, inserting, fixing, constructing, repairing or renewing of artificial dentures or restorative dental appliances, and the performance of any such operation and the giving of any such treatment, advice or attendance, as is usually performed or given by dentists;
(d) "NEET" means the National Eligibility-cum-Entrance Test conducted by the National Board of Examination for admission to post-graduate courses;
(e) "University" means a university established or incorporated by or under a Central Act, a Provincial Act or a State Act, and includes any such institution as may, in consultation with the university concerned, be recognised by the University Grant Commission in accordance with the regulations made in this behalf under this Act.

PART - II

GENERAL CONDITIONS TO BE OBSERVED BY POST GRADUATE TEACHING INSTITUTIONS

SCHEDULE – IX

(See regulation 24)

29. SYALLBUS FOR M.D.S. IN VARIOUS SPECIALTIES

The syllabus for MDS course includes both Applied Basic Sciences and subjects of concerned specialty. The syllabus in Applied Basic Sciences shall vary according to the particular specialty; similarly the candidates shall also acquire adequate knowledge in other subjects related to their respective specialty.

1. PROSTHODONTICS AND CROWN & BRIDGE

AIM:

To train the dental graduates so as to ensure higher level of competence in both general and specialty areas of Prosthodontics and prepare candidates with teaching, research and clinical abilities including prevention and after care in Prosthodontics – removable dental prosthodontics, fixed dental prosthodontics (Crown &Bridge), implantology, maxillofacial prosthodontics and esthetic dentistry.

GENERAL OBJECTIVES OF THE COURSE:

Training program for the dental graduates in Prosthetic dentistry– removable dental prosthodontics, fixed dental prosthodontics (Crown & Bridge), implantology, maxillofacial prosthodontics and esthetic dentistry and Crown & Bridge including Implantology is structured to achieve knowledge and skill in theoretical and clinical laboratory, attitude, communicative skills and ability to perform research with a good understanding of social, cultural, educational and environmental background of the society.

- To have adequate acquired knowledge and understanding of applied basic and systemic medical sciences, both in general and in particularly of head and neck region.
- The postgraduates should be able to provide Prosthodontic therapy for patients with competence and working knowledge with understanding of applied medical, behavioral and clinical science, that are beyond the treatment skills of the general BDS graduates and MDS graduates of other specialties,
- To demonstrate evaluative and judgment skills in making appropriate decisions regarding prevention, treatment, after care and referrals to deliver comprehensive care to patients.

KNOWLEDGE:

The candidate should possess knowledge of applied basic and systemic medical sciences.

- On human anatomy, embryology, histology, applied in general and particularly to head and neck, Physiology & Biochemistry, Pathology Microbiology & virology; health and diseases of various systems of the body (systemic) principles in surgery and medicine, pharmacology, nutrition, behavioral science, age changes, genetics, Immunology, Congenital defects & syndromes and Anthropology, Bioengineering, Bio-medical & Biological Principles
- The student shall acquire knowledge of various Dental Materials used in the specialty and be able to provide appropriate indication, understand the manipulation characteristics, compare with other materials available, be adept with recent advancements of the same.
- Students shall acquire knowledge and practice of history taking, Diagnosis, treatment planning, prognosis, record maintenance of oral, craniofacial and systemic region.
- Ability for comprehensive rehabilitation concept with pre prosthetic treatment plan including surgical re-evaluation and prosthodontic treatment planning, impressions, jaw relations, utility of face bows, articulators, selection and positioning of teeth, teeth

arrangement for retention, stability, esthetics, phonation, psychological comfort, fit and insertion.

- Instructions for patients in after care and preventive Prosthodontics and management of failed restorations shall be possessed by the students.
- Understanding of all the applied aspects of achieving physical, psychological well-being of the patients for control of diseases and / or treatment related syndromes with the patient satisfaction and restoring function of Cranio mandibular system for a quality life of a patient.
- Ability to diagnose and plan treatment for patients requiring Prosthodontic therapy
- Ability to read and interpret radiographs, and other investigations for the purpose of diagnosis and treatment planning.
- The theoretical knowledge and clinical practice shall include principles involved for support, retention, stability, esthetics, phonation, mastication, occlusion, behavioral, psychological, preventive and social aspects of Prosthodontics science of Oral and Maxillofacial Prosthodontics and Implantology
- Tooth and tooth surface restorations, Complete denture Prosthodontics, removable partial denture Prosthodontics, fixed prosthodontics and maxillofacial and Craniofacial Prosthodontics, implants and implant supported Prosthodontics, T.M.J. and occlusion, craniofacial esthetics, and biomaterials, craniofacial disorders, problems of psychogenic origin.
- Should have knowledge of age changes, geriatric psychology, nutritional considerations and prosthodontic therapy in the aged population.
- Should have ability to diagnose failed restoration and provide prosthodontic therapy and after care.
- Should have essential knowledge on ethics, laws, and Jurisprudence and Forensic Odontology in Prosthodontics.
- Should know general health conditions and emergency as related to prosthodontics treatment like allergy of various materials and first line management of aspiration of prosthesis
- Should identify social, cultural, economic, environmental, educational and emotional determinants of the patient and consider them in planning the treatment.
- Should identify cases, which are outside the area of his specialty / competence, refer them to appropriate specialistsand perform interdisciplinary case management.
- To advice regarding case management involving surgical and interim treatment
- Should be competent in specialization of team management in craniofacial prosthesis design.
- To have adequate acquired knowledge, and understanding of applied basic, and systemic medical science knowledge in general and in particular to head and neck regions.
- Should attend continuing education programmes, seminars and conferences related to Prosthodontics, thus updating himself/herself.
- To teach and guide his/her team, colleagues and other students.
- Should be able to use information technology tools and carry out research both in basic and clinical areas, with the aim of publishing his/ her work and presenting his/her work at various scientific forums.
- Should have an essential knowledge of personal hygiene, infection control, prevention of cross infection and safe disposal of waste, keeping in view the risk of transmission of potential communicable and transmissible infections like Hepatitis and HIV.
- Should have an ability to plan and establish Prosthodontics clinic/hospital teaching department and practice management.
- Should have a sound knowledge (of the applications in pharmacology, effects of drugs on oral tissues and systems of body and in medically compromised patients.

SKILLS:

- The candidate should be able to examine the patients requiring Prosthodontic therapy, investigate the patient systemically, analyze the investigation results, radiographs, diagnose the ailment, plan the treatment, communicate it with the patient and execute it.

- To understand the prevalence and prevention of diseases of craniomandibular system related to prosthetic dentistry.
- The candidate should be able to restore lost functions of stomatognathic system like mastication, speech, appearance and psychological comforts by understanding biological, biomedical, bioengineering principles and systemic conditions of the patients to provide quality health care in the craniofacial regions.
- The candidate should be able to demonstrate good interpersonal, communication skills ***and*** team approach in interdisciplinary care by interacting with other specialties including medical specialty for planned team management of patients for craniofacial ***&*** oral acquired and congenital defects, temporomandibular joint syndromes, esthetics, Implant supported Prosthetics and problems of Psychogenic origins.
- Should be able to demonstrate the clinical competence necessary to carry out appropriate treatment at higher level of knowledge, training and practice skills currently available in their specialty area with a patient centered approach.
- Should be able to interpret various radiographs like IOPA, OPG, CBCT and CT. Should and be able to plan and modify treatment plan based on radiographic findings
- Should be able to critically appraise articles published and understand various components of different types of articles and be able to gather the weight of evidence from the same
- To identify target diseases and create awareness amongst the population regarding Prosthodontic therapy.
- To perform Clinical and Laboratory procedures with a clear understanding of biomaterials, tissue conditions related to prosthesis and have required dexterity & skill for performing clinical and laboratory all procedures in fixed, removable, implant, maxillofacial, TMJ and esthetics Prosthodontics.
- To carry out necessary adjunctive procedures to prepare the patient before prosthesis like tissue preparation and preprosthetic surgery and to prepare the patient before prosthesis / prosthetic procedures
- To understand demographic distribution and target diseases of Cranio mandibular region related to Prosthodontics.

ATTITUDES:

- To adopt ethical principles in Prosthodontic practice, Professional honesty, credibility and integrity are to be fostered. Treatment to be delivered irrespective of social status, caste, creed or religion of patient.
- Should be willing to share the knowledge and clinical experience with professional colleagues.
- Should develop an attitude towards quality, excellence, ***non-compromising*** in treatment.
- Should be able to self-evaluate, reflect and improve on their own.
- Should pursue research in a goal to contribute significant, relevant and useful information, concept or methodology to the scientific fraternity.
- Should be able to demonstrate ***evidence-based*** practice while handling cases
- Should be willing to adopt new methods and techniques in prosthodontics from time to time based on scientific research, which are in patient's best interest.
- Should respect patient's rights and privileges, including patient's right to information and right to seek second opinion.

COMMUNICATIVE ABILITIES:

- To develop communication skills, in particular ***and*** to explain treatment options available in the management.
- To provide leadership and get the best out of his / her group in a congenial working atmosphere.
- Should be able to communicate in simple understandable language with the patient and explain the principles of prosthodontics to the patient. He/She should be able to guide and counsel the patient with regard to various treatment modalities available.

- To develop the ability to communicate with professional colleagues through various media like Internet, e-mails, videoconferences etc. to render the best possible treatment. Should demonstrate good explanatory and demonstrating ability as a teacher in order to facilitate learning among students

COURSE CONTENTS:

The course content has been identified and categorized as essential knowledge given below.

ESSENTIAL KNOWLEDGE:

The topics to be considered are Applied Basic Sciences, Oral and Maxillofacial Prosthodontics and Implantology

APPLIED BASIC SCIENCES:

Should develop thorough knowledge on the applied aspects of Anatomy, Embryology, Histology particularly head and neck, Physiology, Biochemistry, Pathology, Microbiology, Virology, Pharmacology, Health and systematic diseases principles in surgery medicine and Anesthesia, Nutrition, Behavioral sciences, age changes, genetics, Dental Material Science, congenital defects and Syndromes and Anthropology, Biomaterial Sciences, Bio-engineering and Bio-medical and Research Methodology as related to Masters degree Prosthodontics and Crown & Bridge including Implantology

It is desirable to have adequate knowledge in Bio-statistics, Research Methodology and use of computers to develop necessary teaching skills in the specialty of Prosthodontics including crown and bridge.

APPLIED ANATOMY OF HEAD AND NECK:

General Human Anatomy –Gross Anatomy, anatomy of Head and Neck in detail:Cranial and facial bones, TMJ and function, muscles of mastication and facial expression, muscles of neck and back including muscles of deglutition and tongue, arterial supply and venous drainage of the head and neck, anatomy of the Para nasal sinuses in relation to the Vth cranial nerve. General considerations of the structure and function of the brain, brief considerations of V, VII, XI, XII, cranial nerves and autonomic nervous system of the head and neck. The salivary glands, Pharynx, Larynx Trachea, Oesophagus, Functional Anatomy of masticatory muscles, Deglutition, speech, respiration, and circulation, teeth eruption, morphology, occlusion and function. Anatomy of TMJ, its movements and myofacial pain dysfunction syndrome.

Embryology –Development of the face, tongue, jaws, TMJ, Paranasal sinuses,pharynx, larynx, trachea, esophagus, Salivary glands, Development of oral and Para oral tissues including detailed aspects of tooth formation.

Growth & Development –Facial form and Facial growth and development overview ofDentofacial growth process and physiology from foetal period to maturity and old age,. General physical growth, functional and anatomical aspects of the head, changes in craniofacial skeletal development, relationship between development of the dentition and facial growth.

Dental Anatomy –Anatomy of primary and secondary dentition, concept of occlusion,mechanism of articulation, and masticatory function. Detailed structural and functional study of the oral and Para oral tissues, normal occlusion, development of occlusion in deciduous mixed and permanent dentitions, root length, root configuration & tooth-numbering systems.

Histology –histology of enamel, dentin, Cementum, periodontal ligament and alveolarbone, pulpal anatomy, histology and biological consideration. Salivary glands and Histology of epithelial tissues including glands.
Histology of general and specific connective tissue including bone, , Salivary glands, Histology of skin, oral mucosa, respiratory mucosa, connective tissue, bone, cartilage, cellular elements of blood vessels, blood, lymphatics, nerves, muscles, tongue and tooth

Cell biology –Brief study of the structure and function of the mammalian cell Components of the cell and functions of various types of cells and their consequences with tissue injury

APPLIED PHYSIOLOGY AND NUTRITION :

Introduction, Mastication, deglutition, digestion and assimilation, Homeostasis, fluid and electrolyte balance, blood composition, volume, function, blood groups and hemorrhage, Blood transfusion, circulation, Heart, Pulse, Blood pressure, capillary and lymphatic circulation. Shock, respiration, control, anoxia, hypoxia, asphyxia, artificial respiration. Endocrine glands in particular reference to pituitary, parathyroid and thyroid glands and sex hormones. Role of calcium and Vit D in growth and development of teeth, bone and jaws. Role of Vit. A, C and B complex in oral mucosal and periodontal health. Physiology and function of the masticatory system. Speech mechanism, mastication, swallowing and deglutition mechanism, salivary glands and Saliva

Endocrines – General principles of endocrine activity and disorders relating to pituitary, thyroid, pancreas, parathyroid, adrenals, gonads, including pregnancy and lactation. Physiology of saliva, urine formation, normal and abnormal constituents, Physiology of pain, Sympathetic and parasympathetic nervous system, neuromuscular co-ordination of the stomatognathic system.

Applied Nutrition – General principles, balanced diet, effect of dietary deficiencies and starvation, Diet, digestion, absorption, transportation and utilization & diet for elderly patients.

APPLIED BIOCHEMISTRY:

General principles governing the various biological activities of the body, such as osmotic pressure, electrolytic dissociation, oxidation-reductionCarbohydrates, proteins, liquids and their metabolism, Enzymes, Vitamins, and minerals, Hormones, Blood, Metabolism of inorganic elements, Detoxification in the body & anti metabolites.

APPLIED PHARMACOLOGY AND THERAPEUTICS:

Dosage and mode of administration of drugs. Action and fate of drugs in the body, Drug addiction, tolerance and hypersensitive reactions, Drugs acting on the central nervous system, general anesthetics hypnotics, analeptics and tranquilizers. Local anesthetics, Chemotherapeutics and antibiotics, Antitubercular and anti syphilitic drugs, Analgesics and antipyretics, Antiseptics, styptics, Sialogogues and antisialogogues, Haematinics, Cortisones, ACTH, insulin and other antidiabetics vitamins: A, D, B – complex group C, K etc. Chemotherapy and Radiotherapy. Drug regime for antibiotic prophylaxis and infectious endocarditis and drug therapy following dental surgical treatments like placement of implants, pre and peri prosthetic surgery

APPLIED PATHOLOGY:

Inflammation, repair and degeneration, Necrosis and gangrene, Circulatory disturbances, Ischaemia, hyperaemia, chronic venous congestion, oedema, thrombosis, embolism and infarction. Infection and infective granulomas, Allergy and hypersensitive reactions, Neoplasms; Classification of tumors, Carcinogenesis, characteristics of benign and malignant tumors, spread of tumors. Applied histo pathology and clinical pathology.

APPLIED MICROBIOLOGY:

Immunity, knowledge of organisms commonly associated with diseases of the oral cavity (morphology cultural characteristics etc) of strepto, staphylo, , Clostridia group of organisms, Spirochaetes, organisms of tuberculosis, leprosy, diphtheria, actinomycosis and moniliasis etc. Virology, Cross infection control, sterilization and hospital waste management

APPLIED ORAL PATHOLOGY:

Developmental disturbances of oral and Para oral structures, Regressive changes of teeth, Bacterial, viral and mycotic infections of the oral cavity. Dental caries, diseases of pulp and periapical tissues, Physical and chemical injuries of the oral cavity, oral manifestations of metabolic and endocrine disturbances, Diseases of the blood and blood forming organism in relation to the oral cavity, Periodontal diseases, Diseases of the skin, nerves and muscles in relation to the Oral cavity.

LABORATORY DETERMINATIONS:

Blood groups, blood matching, R.B.C. and W.B.C. count, Bleeding and clotting time, PT, PTT and INR Smears and cultures – urine analysis and culture. Interpretation of RBS, Glycosylated Hb, GTT

BIOSTATISTICS:

Characteristics and limitations of statistics, planning of statistical experiments, sampling, collection, classification and presentation of data (Tables, graphs, pictograms etc) & Analysis of data, parametric and non parametric tests

Introduction to Biostatistics - Scope and need for statistical application to biological data. Definition of selected terms – scale of measurements related to statistics, Methods of collecting data, presentation of the statistical diagrams and graphs.
Frequency curves, mean, mode of median, Standard deviation and co-efficient of variation, Correlation – Co-efficient and its significance, Binominal distributions normal distribution and Poisson's distribution, Tests of significance.

RESEARCH METHODOLOGY:

Understanding and evaluating dental research, scientific method and the behavior of scientists, understanding to logic – inductive logic – analogy, models, authority, hypothesis and causation,. Measurement and Errors of measurement, presentation of results, Reliability, Sensitivity and specificity diagnosis tests and measurements, Research Strategies, Observation, Correlation, Experimentation and Experimental design. Logic of statistical in(ter)ferences, balance judgements, judgement under uncertainty, clinical vs., scientific judgement, problems with clinical judgement, forming scientific judgements, the problem of contradictory evidence, citation analysis as a Means of literature evaluation, influencing judgement :
Protocol writing for experimental, observational studies, survey including hypothesis, PICO statement, aim objectives, sample size justification, use of control/placebo, standardization techniques, bias and its elimination, blinding, evaluation, inclusion and exclusion criteria.

APPLIED RADIOLOGY:

Introduction, radiation, background of radiation, sources, radiation biology, somatic damage, genetic damage, protection from primary and secondary radiation, Principles of X-ray production, Applied principles of radio therapy and after care.

ROENTGENOGRAPHIC TECHNIQUES:

Intra oral, extra oral roentgenography, Methods of localization digital radiology and ultra sounds. Normal anatomical landmarks of teeth and jaws in radiograms, temporomandibular joint radiograms, neck radiograms.
Use of CT and CBCT in prosthodontics

APPLIED MEDICINE:

Systemic diseases and (its) their influence on general health and oral and dental health. Medical emergencies like syncope, hyperventilation, angina, seizure, asthma and allergy/anaphylaxis in the dental offices – Prevention, preparation, medico legal consideration, unconsciousness, respiratory distress, altered consciousness, seizures, drug related emergencies, chest pain, cardiac arrest, premedication, prophylaxis and management of ambulatory patients, resuscitation, applied psychiatry, child, adult and senior citizens.

APPLIED SURGERY & ANESTHESIA:

General principles of surgery, wound healing, incision wound care, hospital care, control of hemorrhage, electrolyte balance. Common bandages, sutures, splints, shifting of critically ill patients, prophylactic therapy, bone surgeries, grafts, etc, surgical techniques, nursing assistance, anesthetic assistance.
Principles in speech therapy, surgical and radiological craniofacial oncology, applied surgical ENT and ophthalmology.

APPLIED PLASTIC SURGERY:

Applied understanding and assistance in programs of plastic surgery for prosthodontics therapy.

APPLIED DENTAL MATERIALS:

- Students should have understanding of all materials used for treatment of craniofacial disorders – Clinical, treatment, and laboratory materials, associated materials, technical considerations, shelf life, storage, manipulations, sterilization, and waste management.
- Students shall acquire knowledge of testing biological, mechanical and other physical properties of all materials used for the clinical and laboratory procedures in prosthodontic therapy.
    - Students shall acquire full knowledge and practice of Equipments, instruments, materials, and laboratory procedures at a higher level of competence with accepted methods.

All clinical practices shall involve personal and social obligation of cross infection control, sterilization and waste management.

ORAL AND MAXILLOFACIAL PROSTHODONTICS AND IMPLANTOLOGY:

I. NON-SURGICAL AND SURGICAL METHODS OF PROSTHODONTICS AND IMPLANTOLOGY

a. Prosthodontic treatment for completely edentulous patients – Complete dentures, immediate complete dentures, single complete dentures, tooth supported complete dentures & Implant supported Prosthesis for completely edentulous patients for typical and atypical cases
b. Prosthodontic treatment for partially edentulous patients: - Clasp-retained acrylic and cast partial dentures, transitional dentures, immediate dentures,

intra coronal and extra coronal precision attachments retained partial dentures & maxillofacial prosthesis for typical and atypical cases

Prosthodontic treatment for edentulous patients: - Complete Dentures and Implant supported Prosthesis.

Complete Denture Prosthesis – Definitions, terminologies, G.P.T., Boucher's clinical dental terminology

Scope of Prosthodontics – The Cranio Mandibular system and its functions, the reasons for loss of teeth, consequences of loss of teeth and treatment modality with various restorations and replacements

a) **Edentulous Predicament**, Biomechanics of the edentulous state, Supportmechanism for the natural dentition and complete dentures, Biological considerations, Functional and Para functional considerations, Esthetic, behavioral and adaptive responses, Temporomandibular joints changes.

b) **Effects of aging of edentulous patients** –aging population, distribution andedentulism in old age, impact of age on edentulous mouth – Mucosa, Bone, saliva, jaw movements in old age, taste and smell, nutrition, aging, skin and teeth, concern for personal appearance in old age

c) **Sequelae caused by wearing complete denture** –the denture in the oralenvironment – Mucosal reactions, altered taste perception, burning mouth syndrome, gagging, residual ridge (reduction) resorption, denture stomatitis, flabby ridge, denture irritation hyperplasia, traumatic Ulcers, Oral cancer in denture wearers, nutritional deficiencies, masticatory ability and performance, nutritional status and masticatory functions.

d) **Temporomandibular disorders in edentulous patients** –Epidemiology,etiology and management, Pharmacotherapy, Physical modalities, and Bio-behavioral modalities

e) **Nutrition Care for the denture wearing patient** –Impact of dental status onfood intake, Gastrointestinal functions, nutritional needs and status of older adults, Calcium and bone health, vitamin and herbal supplementation, dietary counseling and risk factor for malnutrition in patients with dentures and when teeth are extracted.

f) **Preparing patient for complete denture patients** –Diagnosis and treatment planning for edentulous and partially edentulous patients – familiarity with patients, principles of perception, health questionnaires and identification data, problem identification, prognosis and treatment identification data, problem identification, prognosis and treatment planning – contributing history – patient's history, social information, medical status –

systemic status with special reference to debilitating diseases, diseases of the joints, cardiovascular disorders, diseases of the skin, neurological disorders, oral malignancies, climacteric, use of drugs, mental health – mental attitude, psychological changes, adaptability, geriatric changes – physiologic, pathological, pathological and intra oral changes. Intra oral health – mucus membrane, alveolar ridges, palate and vestibular sulcus and dental health.

Data collection and recording, visual observation, radiography, palpation, measurement of sulci or fossae, extra oral measurement, the vertical dimension of occlusion, diagnostic casts.

Specific observations – existing dentures, soft tissue health, hard tissue health – teeth, bone

Biomechanical considerations – jaw relations, border tissues, saliva, muscular development – muscle tone, neuromuscular co-ordination, tongue, cheek and lips.

Interpreting diagnostic findings and treatment planning

g) **Pre prosthetic surgery** –Improving the patients denture bearing areas andridge relations.

h) **Non surgical methods** –rest for the denture supporting tissues, occlusal correction of the old prosthesis, good nutrition, conditioning of the patients musculature,

i) **Surgical methods** –Correction of conditions, that preclude optimal prosthetic function – hyperplastic ridge – epulis fissuratum and papillomatosis, frenular attachments

and pendulous maxillary tuberosities, ridge augmentation, maxillary and mandibular oral implants, corrections of congenital deformities, discrepancies in jaw size, relief of pressure on the mental foramen, enlargement of denture bearing areas, vestibuloplasty, ridge augmentation, replacement of tooth roots with Osseo integrated denture implants.

j) **Immediate Denture** –Advantages, Disadvantages, Contraindications,Diagnosis, treatment planning and Prognosis, Explanation to the patient, Oral examinations, Examination of existing prosthesis, Tooth modification, Prognosis, Referrals/adjunctive care, oral prophylaxis and other treatment needs.

First visit, preliminary impressions and diagnostic casts, management of loose teeth, custom trays, final impressions and master casts, two tray or sectional custom impression tray, location of posterior limit and jaw relation records, setting of the posterior denture teeth / verifying jaw relations and the patient try in.

Laboratory phase, setting of anterior teeth, Wax contouring, flasking and boil out, processing and finishing, surgical templates, surgery and immediate denture insertion, post operative care and patient instructions, subsequent service for the patient on the immediate denture.

k) **Over dentures** (tooth supported complete dentures)–indications andtreatment planning, advantages and disadvantages, selection of abutment teeth, loss of abutment teeth, tooth supported complete dentures. Non-coping abutments, abutment with copings, abutments with attachments, submerged vital roots, preparations of the retained teeth.

l) **Single Dentures:** Single Mandibular denture to oppose natural maxillaryteeth, single complete maxillary denture to oppose natural Mandibular teeth to oppose a partially edentulous Mandibular arch with fixed prosthesis, partially edentulous Mandibular arch with removable partial dentures. Opposing existing complete dentures, preservation of the residual alveolar ridge, necessity for retaining maxillary teeth and preventing mental trauma.

m) **Art of communication in the management of the edentulous predicament** – Communication–scope, a model of communication, why communication is important? What are the elements of effective communication? special significance of doctor / patient communication, doctor behavior, The iatro sedative (doctor & act of making calm) recognizing and acknowledging the problem, exploring and identifying the problem, interpreting and explaining the problem, offering a solution to the problem for mobilizing their resources to operate in a most efficient way, recognizing and acknowledging the problem, interpreting and explaining the problem, offering a solution to the problem.

n) **Materials prescribed in the management of edentulous patients -** Denture base materials, General requirements of biomaterials for edentulous patients, requirement of an ideal denture base, chemical composition of denture base resins, materials used in the fabrication of prosthetic denture teeth, requirement of prosthetic denture teeth, denture lining materials and tissue conditioners, cast metal alloys as denture bases – base metal alloys.

o) **Articulators** – **Evolution of concepts,** Classification, selection, limitations, precision, accuracy andsensitivity, and Functions of the articulator and their uses. Recent advancements including virtual articulator

p) **Fabrication of complete dentures** –complete denture impressions–muscles of facial expressions and anatomical landmarks, support, retention, stability, aims and objectives of preservation, support, stability, aesthetics, and retention. Impression materials and techniques – need of 2 impressions the preliminary impression and final impressions.

Developing an analogue / substitute for the maxillary denture bearing area – anatomy of supporting structures – mucous membrane, hard palate, residual ridge, shape of the supporting structure and factors that influence the form and size of the supporting bones, incisive foramen, maxillary tuberosity, sharp spiny process, torus palatinus, Anatomy of peripheral or limiting structures, labial vestibule, Buccal vestibule, vibrating lines. Preliminary and final impressions, impression making, custom tray and refining the custom tray, preparing the tray to secure the final impression, making the final impression, boxing impression and making the casts

Developing an analogue / substitute for the Mandibular denture bearing area-anatomy of supporting structure, crest of the residual ridge, buccal shelf, shape of

supporting structure, mylohyoid ridge, mental foramen, genial tubercles, torus mandibularis, Anatomy of peripheral or limiting structure – labial vestibule, Buccal vestibule, lingual border, mylohyoid muscle, retromylohyoid fossa, sublingual gland region, alveolingual sulcus, Mandibular impressions – preliminary impressions, custom tray, refining, preparing the tray\, final impressions.

q) **Mandibular movements, Maxillo mandibular relations and concepts of occlusion –** Gnathology, identification of shape and location of arch form–Mandibular and maxillary occlusion rims, level of occlusal plane and recording of trail denture base, tests to determine vertical dimension of occlusion, interocclusal & centric relation records. Biological and clinical considerations in making jaw relation records and transferring records from the patients to the articulator, Recording of Mandibular movements – influence of opposing tooth contacts, temporomandibular joint, muscular involvements, neuromuscular regulation of Mandibular motion, the envelope of motion, rest position.

Maxillo – Mandibular relations – the centric, eccentric, physiologic rest position, vertical dimension, occlusion, recording methods – mechanical, physiological, Determining the horizontal jaw relation – Functional graphics, tactile or interocclusal check record method, Orientation / sagittal relation records, Arbitrary / Hinge axis and face bow record, significance and requirement, principles and biological considerations and securing on articulators.

r) **Selecting and arranging artificial teeth and occlusion for the edentulous patient –** anterior tooth selection, posterior tooth selection, and principles in

arrangement of teeth, and factors governing the position of teeth – horizontal & vertical relations. The inclinations and arrangement of teeth for aesthetics, phonetics and mechanics – to concept of occlusion.

s) **The Try in** –verifying vertical dimension, centric relation, establishment ofposterior palatal seal, creating a facial and functional harmony with anterior teeth, harmony of spaces of individual teeth position, harmony with sex, personality and age of the patient, co-relating aesthetics and incisal guidance.

t) **Speech considerations with complete dentures & speech production** –structural and functional demands, neuropsychological background, speech production and the roll of teeth and other oral structures – bilabial sounds, labiodental(s) sounds, linguodental sounds, linguoalveolar sound, articulatoric characteristics, acoustic characteristics, auditory characteristics, linguopalatal and linguoalveolar sounds, speech analysis and prosthetic considerations.

u) **Waxing contouring and processing the dentures their fit and insertion and after care** –laboratory procedure–wax contouring, flasking andprocessing, laboratory remount procedures, ***selective grinding***, finishing and polishing.

Critiquing the finished prosthesis – doctors evaluation, patients evaluation, friends evaluation, elimination of basal surface errors, errors in occlusion, interocclusal records for remounting procedures – verifying centric relation, eliminating occlusal errors.

Special instructions to the patient – appearance with new denture, mastication with new dentures, speaking with new dentures, oral hygiene with dentures, preservation of residual ridges and educational material for patients, maintaining the comfort and health of the oral cavity in the rehabilitated edentulous patients. Twenty-four hours oral examination and treatment and (preventive) Prosthodontic – periodontic recall for oral examination 3 to 4 months intervals and yearly intervals.

v) **Implant supported Prosthesis for partially edentulous patients** –Scienceof Osseo integration, clinical protocol ***(diagnostic,surgical and prosthetic***) for treatment with implant supported over dentures, managing problems and complications. Implant Prosthodontics for edentulous patients: current and future directions.

Implant supported prosthesis for partially edentulous patients – Clinical and laboratory protocol: Implant supported prosthesis, managing problems and complications

- Introduction and Historical Review
- Biological, clinical and surgical aspects of oral implants
- Diagnosis and treatment planning

- Radiological interpretation for selection of fixtures
- Splints for guidance fort surgical placement of fixtures
- ***Surgical and*** Intra oral plastic surgery, if any
- Guided bone and Tissue regeneration consideration for implants fixture.
- Implant supported prosthesis for complete edentulism and partial edentulism
- Occlusion for implant supported prosthesis.
- Peri-implant tissue and Management of peri-implantitis
- Maintenance and after care
- Management of failed restoration.
- Work authorization for implant supported prosthesis – definitive instructions, legal aspects, delineation of responsibility.

Prosthodontic treatment for partially edentulous patients – Removable partial Prosthodontics –

a**. Scope, definition** and terminology, Classification of partially edentulous arches - requirements of an acceptable method of classification, Kennedy's classification, Applegate's rules for applying the Kennedy classification

b. **Components of RPD** –

i) major connector–mandibular and maxillary

ii) minor connectors, design, functions & form and location of major and minor connectors, tissue stops, finishing lines, reaction of tissue to metallic coverage

iii) Rest and rest seats – form of the Occlusal rest and rest seat, interproximal Occlusal rest seats, internal Occlusal rests, possible movements of partial dentures, support for rests, lingual rests on canines and incisor teeth, incisal rest and rest seat.

iv) Direct retainers- Internal attachments & extracoronal direct retainers. Relative uniformity of retention, flexibility of clasp arms, stabilizing reciprocal clasp, criteria for selecting a given clasp design, the basic principles of clasp design, circumferential clasp, bar clasp, combination clasp and other type of retainers.

v) Indirect Retainers – denture rotation about an axis, factors influencing effectiveness of indirect retainers, forms of indirect retainers, auxiliary Occlusal rest, canine extensions from Occlusal rests, canine rests, continuous bar retainers and linguoplates, modification areas, rugae support, direct – indirect retention.

(vi) Teeth and denture bases – types, materials, advantages and dis-advantages, indications and contraindications and clinical use.

Principles of removable partial Denture design – Bio mechanical considerations, and the factors influencing after mouth preparations – Occlusal relationship of remaining teeth, orientation of Occlusal plane, available space for restoration, arch integrity, tooth morphology, response of oral structure to previous stress, periodontal conditions, abutment support, tooth supported and tooth and tissue supported, need for indirect retention, clasp design, need for rebasing, secondary impression, need for abutment tooth modification, type of major connector, type of teeth selection, patients past experience, method of replacing single teeth or missing anterior teeth.

Difference between tooth supported and tissue supported partial dentures. Essentials of partial denture design, components of partial denture design, tooth support, tissue support, stabilizing components, guiding planes, use of splint bar for denture support, internal clip attachments, overlay abutment as support for a denture base, use of a component partially to gain support.

c. **Education of patient**

d. **Diagnosis and treatment planning**

e. **Design, treatment sequencing and mouth preparation**

f. **Surveying** –Description of dental surveyor, purposes of surveying, Aims andobjectives in surveying of diagnostic cast and master cast, Final path of insertion, factors that determine path of insertion and removal, Recording relation of cast to surveyor, measuring amount of retentive area Blocking of

master cast – paralleled blockout, shaped blockout, arbitrary blockout and relief.

g. **Diagnosis and treatment planning** –Infection control and cross infectionbarriers – clinical and laboratory and hospital waste management, Objectives of prosthodontic treatment, Records, systemic evaluation, Oral examination, preparation of diagnostic cast, interpretation of examination data, radiographic interpretation, periodontal considerations, caries activity, prospective surgical preparation, endodontic treatment, analysis of occlusal factors, fixed restorations, orthodontic treatment, need for determining the design of components, impression procedures and occlusion, need for reshaping remaining teeth, reduction of unfavorable tooth contours, differential diagnosis : fixed or removable partial dentures, choice between complete denture and removable partial dentures, choice of materials

h. **Preparation of Mouth for removable partial dentures** –Oral surgicalpreparation, conditioning of abused and irritated tissues, periodontal preparation – objectives of periodontal therapy, periodontal diagnosis, control therapy, periodontal surgery.

i. **Preparation of Abutment teeth** –Classification of abutment teeth, sequenceof abutment preparations on sound enamel or existing restorations, conservative restorations using crowns, splinting abutment teeth, utilization, temporary crowns to be used as abutment.

j. **Impression Materials and Procedures for Removable Partial Dentures** –Rigid materials, thermoplastic materials, Elastic materials, Impressions of the partially edentulous arch, Tooth supported, tooth tissue supported, Individual impression trays.

k. **Support for the Distal Extension Denture Base** –Distal extensionremovable partial denture, Factors influencing the support of distal extension base, Methods of obtaining functional support for the distal extension base.

l. **Laboratory Procedures** –Duplicating a stone cast, Waxing the partialdenture framework, Anatomic replica patterns, Spruing, investing, burnout, casting and finishing of the partial denture framework, making record bases, occlusion rims, making a stone occlusal template from a functional occlusal record, arranging posterior teeth to an opposing cast or template, arrangement of anterior teeth, waxing and investing the partial denture before processing acrylic resin bases, processing the denture, remounting and occlusal correction to an occlusal template, polishing the denture.

m. **Initial placement, adjustment and servicing of the removable partial denture** –adjustments to bearing surfaces of denture framework, adjustmentof occlusion in harmony with natural and artificial dentition, instructions to the patient, follow – up services

n. **Relining and Rebasing the removable partial denture** –Relining toothsupported dentures bases, relining distal extension denture bases, methods of reestablishing occlusion on a relined partial denture.

o. **Repairs and additions to removable partial dentures** –Broken clasp arms,fractured occlusal rests, distortion or breakage of other components – major and minor connectors, loss of a tooth or teeth not involved in the support or retention of the restoration, loss of an abutment tooth necessitating its replacement and making a new direct retainer, Other types of repairs & repair by soldering.

p. **Removable partial denture considerations in maxillofacial prosthetics** – Maxillofacial prosthetics, intra oral prosthesis, design considerations,
maxillary prosthesis, Obturators, speech aids, palatal lifts, palatal augmentations, mandibular prosthesis, treatment planning, framework design, class I resection, Class II resection, mandibular flange prosthesis, jaw relation records.

q. **Management of failed restorations and work authorization details.**

II. MAXILLOFACIAL REHABILITATION:

Scope, terminology, definitions, cross infection control and hospital waste management, work authorization.

Behavioral and psychological issues in Head and neck cancer, Psychodynamic interactions between clinician and patient. **Cancer Chemotherapy:** Oral Manifestations, Complications, and management, **Radiation therapy of head and neck tumors:** Oral effects, Dental manifestations and dental treatment: Etiology, treatment and rehabilitation (restoration).

Acquired defects of the mandible, acquired defects of hard palate, soft palate, clinical management of edentulous and partially edentulous maxillectomy patients, Facial defects, Restoration of speech, Velopharyngeal function, cleft lip and palate, cranial implants, maxillofacial trauma, Lip and cheek support prosthesis, Laryngectomy aids, Obstructive sleep apnoea, Tongue prosthesis, Oesophageal prosthesis, radiation carriers, Burn stents, Nasal stents, Vaginal and anal stents, Auditory inserts, Trismus appliances, mouth controlled devices for assisting the handicapped, custom prosthesis, conformers, and orbital prosthesis for ocular and orbital defects. Osseo integrated supported facial and maxillofacial prosthesis. Resin bonding for maxillofacial prosthesis, cranial prosthesis Implant rehabilitation of the mandible compromise by radiotherapy, Prosthodontic treatment, Material and laboratory procedures for maxillofacial prosthesis.

III. OCCLUSION

EVALUATION, DIAGNOSIS AND TREATMENT OF OCCLUSAL PROBLEMS:

Scope, definition, terminology, optimum oral health, anatomic harmony, functional harmony, occlusal stability, causes of deterioration of dental and oral health. Anatomical, physiological, neuro – muscular, psychological considerations of teeth; muscles of mastication; temporomandibular joint; intra oral and extra oral and facial musculatures and the functions of Cranio mandibular system.

Occlusal therapy, the stomatognathic system, centric relation, vertical dimension, the neutral zone, the occlusal plane, differential diagnosis of temporomandibular disorders, understanding and diagnosing intra articular problems, relating treatment to diagnosis of internal derangements of TMJ, Occlusal splints. Selecting instruments for occlusal diagnosis and treatment, mounting casts, Pankey-Mann-Schuyler philosophy of complete occlusal rehabilitation, long centric, anterior guidance, restoring lower anterior teeth, restoring upper anterior teeth, determining the type of posterior occlusal contours, methods for determining the plane of occlusion, restoring lower posterior teeth, restoring upper posterior teeth, functionally generated path techniques for recording border movements intra orally, occlusal equilibration.

Bruxism, Procedural steps in restoring occlusion, requirements for occlusal stability, solving occlusal problems through programmed treatment planning, splinting, solving – occlusal wear problems, deep overbite problems, anterior overjet problems, anterior open bite problems. Treating – end to end occlusion, splaed anterior teeth, cross bite problems, Crowded, irregular, or interlocking anterior bite. Using Cephalometric for occlusal analysis, solving severe arch malrelationship problems, transcranial radiography, postoperative care of occlusal therapy.

IV. FIXED PROSTHODONTICS

Scope, definitions and terminology, classification and principles, design, mechanical and biological considerations of components – Retainers, connectors, pontics, work authorization.

- **Diagnosis and treatment planning** –patients history and interview, patientsdesires and expectations and needs, systemic and emotional health, clinical examinations – head and neck, oral – teeth, occlusal and periodontal, Preparation of diagnostic cast, radiographic interpretation, Aesthetics, endodontics considerations, abutment selection – bone support, root proximities and inclinations, selection of abutments for cantilever, pier

abutments, splinting, available tooth structures and crown morphology, TMJ and muscles of mastication and comprehensive planning and prognosis.

- **Management of Carious teeth** –caries in aged population, caries control,removal caries, protection of pulp, reconstruction measure for compromised teeth – retentive pins, horizontal slots, retentive grooves, prevention of caries, diet, prevention of root caries and vaccine for caries.
- **Periodontal considerations** –attachment units, ligaments, prevention ofgingivitis, periodontitis. Microbiological aspect of periodontal diseases, marginal lesion, occlusal trauma, periodontal pockets in attached gingiva, interdental papilla, gingival embrasures, gingival/periodontal prosthesis, radiographic interpretations of Periodontia, intraoral, periodontal splinting – Fixed prosthodontics with periodontially compromised dentitions, placement of margin restorations.
- **Biomechanical principles of tooth preparation** –individual tooth preparations - Complete metal Crowns – P.F.C., All porcelain – Cerestore crowns, dicor crowns, incer**a**m etc. porcelain jacket crowns; partial 3/4, 7/8, telescopic, pin– ledge, laminates, inlays, onlays. Preparations for restoration of teeth– amalgam, glass Ionomer and composite resins. Resin bond retainers, Gingival marginal preparations – Design, material selection, and biological and mechanical considerations – intracoronal retainer and precision attachments – custom made and prefabricated.

- **Isolation and fluid control –** Rubber dam application(s), tissue dilation–softtissue management for cast restoration, impression materials and techniques, provisional restorations, interocclusal records, laboratory support for fixed Prosthodontics, Occlusion, Occlusal equilibration, articulators, recording and transferring of occlusal relations, cementing of restorations.
- **Resins, Gold and gold alloys, glass Ionomer, restorations.**
- **Restoration of endodontically treated teeth, Stomatognathic Dysfunction and management**
- **Management of failed restorations**
  Osseo integrated supported fixed Prosthodontics –Osseo integratedsupported and tooth supported fixed Prosthodontics
- **CAD – CAM Prosthodontics**

V. TMJ – Temporomandibular joint dysfunction – Scope, definitions, and terminology

Temporomandibular joint and its function, Orofacial pain, and pain from the temporomandibular joint region, temporomandibular joint dysfunction, temporomandibular joint sounds, temporomandibular joint disorders, Anatomy related, trauma, disc displacement, Osteoarthrosis/Osteoarthritis, Hyper mobility and dislocation, infectious arthritis, inflammatory diseases, Eagle's syndrome (Styloid – stylohyoid syndrome), Synovial chondromatosis, Osteochondrosis disease, Ostonecrosis, Nerve entrapment process, Growth changes, Tumors, Radiographic imaging

- Etiology, diagnosis and cranio mandibular pain, differential diagnosis and management of orofacial pain – pain from teeth, pulp, dentin, muscle pain, TMJ pain – psychologic, physiologic – endogenous control, acupuncture analgesia, Placebo effects on analgesia, Trigeminal neuralgia, Temporal arteritis
- Occlusal splint therapy – construction and fitting of occlusal splints, management of occlusal splints, therapeutic effects of occlusal splints, occlusal splints and general muscles performance, TMJ joint uploading and anterior repositioning appliances, use and care of occlusal splints.
- Occlusal adjustment procedures – Reversible – occlusal stabilization splints and physical therapies, jaw exercises, jaw manipulation and other physiotherapy or irreversible therapy – occlusal repositioning appliances, orthodontic treatment,

Orthognathic surgery, fixed and removable prosthodontic treatment and occlusal adjustment, removable prosthodontic treatment and occlusal adjustment. Indication for occlusal adjustment, special nature of orofacial pain, Psychopathological considerations, occlusal adjustment philosophies, mandibular position, excursive guidance, occlusal contact scheme, goals of occlusal adjustment, significance of a slide in centric, Preclinical procedures, clinical procedures for occlusal adjustment.

VI. ESTHETICS

SCOPE, DEFINITIONS :

Morpho psychology and esthetics, structural esthetic rules –facialcomponents, dental components, gingival components and physical components. Esthetics and its relationship to function – Crown morphology, physiology of occlusion, mastication, occlusal loading and clinical aspect in bio esthetic aspects, Physical and physiologic characteristic and muscular activities of facial muscle, perioral anatomy and muscle retaining exercises Smile – classification and smile components, smile design, esthetic restoration of smile, Esthetic management of the dentogingival unit, intraoral materials for management of gingival contours, and ridge contours, Periodontal esthetics, Restorations – Tooth colored restorative materials, the clinical and laboratory aspects, marginal fit, anatomy, inclinations, form, size, shape, color, embrasures & contact point.

Prosthodontic treatment should be practiced by developing skills, by treating various and more number of patients to establish skill to diagnose and treatment and after care with bio-mechanical, biological, bio-esthetics, bio-phonetics. All treatments should be carried out in more numbers for developing clinical skills.

- Infection control, cross infection barrier – clinical & lab ; hospital & lab waste management

Teaching / Learning Activities:

The post graduate is expected to complete the following at the end of :

I YEAR M.D.S.

- Theoretical exposure of all applied sciences
- ***Pre-clinical*** exercises involved in prosthodontic therapy for assessment
- Commencement of library assignment within six months
- To carry out short epidemiological study relevant to prosthodontics.
- Acquaintance with books, journals and referrals.
- To differentiate various types of articles published in and critically appraise based on standard reference guidelines.
- To develop the ability to gather evidence from published articles.
- To acquire knowledge of published books, journals and websites for the purpose of gaining knowledge and reference – in the field of ***Oral and Maxillofacial Prosthodontics and Implantology***
- Acquire knowledge of instruments, equipment, and research tools in Prosthodontics.
- To acquire knowledge of Dental Material Science – Biological and biomechanical & bio-esthetics, knowledge of using material in laboratory and clinics including testing methods for dental materials.
- Submit a protocol for their dissertation before Institutional Review Board and Institutional Ethics Committee.
- Participation and presentation in seminars, didactic lectures.

II YEAR M.D.S.

- Acquiring confidence in obtaining various phases and techniques in removable and fixed prosthodontics therapy
- Acquiring confidence by clinical practice with sufficient number of patientsrequiring tooth and tooth surface restorations
- Fabrication of adequate number of complete denture prosthesis following, higher clinical approach by utilizing semi-adjustable articulators, face bow and graphic tracing.
- Understanding the use of dental surveyor and its application in diagnosis and treatment plan in R.P.D.
- Adequate number of R.P.D's covering all partially edentulous situations.
- Adequate number of Crowns, Inlays, laminates, ***FDP (fixed dental prosthesis)*** covering all clinical situations.
- Selection of cases and following principles in treatment of partially or complete edentulous patients by implant supported prosthesis.
- Treating single edentulous arch situations by implant supported prosthesis.
- Diagnosis and treatment planning for implant prosthesis.
- Ist stage and IInd stage implant surgery
- Understanding the maxillofacial ***Prosthodontics, treating craniofacial and management of orofacial defects***
- Prosthetic management of TMJ syndrome
- Occlusal rehabilitation
- Management of failed restorations.
- Prosthodontic management of patient with psychogenic disorder.
- Practice of child and geriatric prosthodontics.
- Participation and presentation in seminars, didactic and non didactic Teaching and Training students.

III YEAR M.D.S

- Clinical and laboratory practice continued from IInd year.
- Occlusion equilibration procedures – fabrication of stabilizing splint for parafunctional disorders, occlusal disorders and TMJ functions.
- Practice of dental, oral and facial esthetics
- The clinical practice of all aspects of Prosthodontic therapy for elderly patients.
- Implants Prosthodontics – Rehabilitation of Partial Edentulism, Complete edentulism and craniofacial rehabilitation.
- Failures in all aspects of Prosthodontics and their management and after care.
- Team management for esthetics, TMJ syndrome and Maxillofacial & Craniofacial Prosthodontics
- Management of Prosthodontic emergencies, resuscitation.
- Candidate should complete the course by attending a large number and variety of patients to master the prosthodontic therapy. This includes the practice management, examinations, treatment planning, communication with patients, clinical and laboratory techniques materials and instrumentation required in different aspects of prosthodontic therapy, Tooth and Tooth surface restoration, Restoration of root treated teeth, splints for periodontal rehabilitations and fractured jaws, complete dentures, R.P.D's, F.D.P's,

  Immediate dentures, over dentures, implant supported prosthesis, maxillofacial and body prosthesis, occlusal rehabilitation.
- Prosthetic management of TMJ syndrome
- Management of failed restorations
- Should complete and submit Main Dissertation assignment 6 months prior to examination.

- Candidates should acquire complete theoretical and clinical knowledge through seminars, symposium, workshops and reading.
- Participation and presentation in seminars, didactic lectures

PROSTHODONTIC TREATMENT MODALITIES

1) Diagnosis and treatment planning prosthodontics

2) Tooth and tooth surface restorations
- Fillings
- Veneers – composites and ceramics
- Inlays- composite, ceramic and alloys
- Onlay – composite, ceramic and alloys
- Partial crowns – ¾ th, 4/5th, 7/8th, Mesial ½ crowns
- Pin-ledge
- Radicular crowns
- Full crowns

3) Tooth replacements

	Partial	**Complete**
• Tooth supported	Fixed partial denture	Overdenture
• Tissue supported	Interim partial denture	Complete denture
	Intermediate partial denture	Immediate denture
		Immediate complete denture
• Tooth and tissue Supported	Cast partial denture Precision attachment	Overdenture
• Implant supported	Cement retained Screw retained Clip attachment	Bar attachment Ball attachment
• Tooth and implant Supported	Screw retained Cement retained	Screw retained Cement retained
• **Root supported**	Dowel and core Pin retained	Over denture

- Precision attachments
  - Intra coronal attachments
  - Extra coronal attachments
  - Bar – slide attachments
  - Joints and hinge joint attachments

4) Tooth and tissue defects (Maxillo- facial and Cranio-facial prosthesis)

A. **Congenital Defects**

a. Cleft lip and palate
b. Pierre Robin Syndrome
c. Ectodermal dysplasia
d. Hemifacial microstomia
e. Anodontia
f. Oligodontia
g. Malformed teeth

} cast partial dentures, implant supported prosthesis, complete dentures, fixed partial dentures

B. **Acquired defects**

a. Head and neck cancer patients – prosthodontic splints and stents
b. Restoration of facial defects
   – Auricular prosthesis
   – Nasal prosthesis
   – Orbital prosthesis
   – Craniofacial implants
c. Midfacial defects
d. Restoration of maxillofacial trauma
   e. Hemimandibulectomy
   f. Maxillectomy

   } cast partial denture, implant supported Dentures

   g. Lip and cheek support prosthesis — complete dentures
   h. Ocular prosthesis
   i. Speech and Velopharyngeal prosthesis
   j. Laryngectomy aids
   k. Esophageal prosthesis
   l. Nasal stents
   m. Tongue prosthesis
   n. Burn stents
   o. Auditory inserts
   p. Trismus appliances

5) T.M.J and Occlusal disturbances

a. Occlusal equilibration
b. Splints - Diagnostic
   - Repositioners / Deprogrammers
c. Anterior bite planes
d. Posterior bite planes
e. Bite raising appliances
f. Occlusal rehabilitation

6) Esthetic/Smile designing

a. Laminates / Veneers
b. Tooth contouring (peg laterals, malformed teeth)
c. Tooth replacements
d. Team management

7) Psychological therapy

a. Questionnaires
b. Charts, papers, photographs
c. Models
d. Case reports
e. Patient counseling
f. Behavioral modifications
g. Referrals

8) Geriatric Prosthodontics

a. Prosthodontics for the elderly
b. Behavioral and psychological counseling
c. Removable Prosthodontics
d. Fixed Prosthodontics
e. Implant supported Prosthodontics
f. Maxillofacial Prosthodontics
g. Psychological and physiological considerations

9) Preventive measures

a. Diet and nutrition modulation and counseling
b. Referrals

The bench work should be completed before the start of clinical work during the first year of the MDS Course

I. Complete dentures

1. Arrangements on adjustable articulator for
   - Class I
   - Class II
   - Class III
2. Various face bow transfers to adjustable articulators
3. Processing of characterized anatomical dentures

II. Removable partial dentures

1. Design for Kennedy's Classification
   (Survey, block out and design)
   a. Class I
   b. Class II
   c. Class III
   d. Class IV
2. Designing of various components of RPD
3. Wax pattern on refractory cast
   a. Class I
   b. Class II
   c. Class III
   d. Class IV
4. Casting and finishing of metal frameworks
5. Acrylisation on metal frameworks for
   Class I
   Class III with modification

III. Fixed Partial Denture

1. Preparations on ivory teeth / natural teeth
   - FVC for metal
   - FVC for ceramic
   - Porcelain jacket crown
   - Acrylic jacket crown
   - PFM crown
   - 3/4th (canine, premolar and central)

- 7/8th posterior
- Proximal half crown

- Inlay – Class I, II, V
- Onlay – Pin ledged, pinhole
- Laminates

2. Preparation of different die systems

3. Fabrication of wax patterns by drop wax build up technique
   - Wax in increments to produce wax coping over dies of tooth preparations on substructures
   - Wax additive technique
   - 3-unit wax pattern (maxillary and Mandibular)
   - Full mouth

4. Pontic designs in wax pattern
   - Ridge lap
   - Sanitary
   - Modified ridge lap
   - Modified sanitary
   - Spheroidal or conical

5. Fabrication of metal frameworks
   - Full metal bridge for posterior (3 units)
   - Coping for anterior (3 unit)
   - Full metal with acrylic facing
   - Full metal with ceramic facing
   - Adhesive bridge for anteriors
   - Coping for metal margin ceramic crown
   - Pin ledge crown

6. Fabrication of crowns
   - All ceramic crowns with characterisation
   - Metal ceramic crowns with characterisation
   - Full metal crown
   - Precious metal crown
   - Post and core

7. Laminates
   - Composites with characterisation
   - Ceramic with characterisation
   - Acrylic

8. Preparation for composites
   - Laminates
   - Crown
   - Inlay
   - Onlay
   - Class I
   - Class II
   - Class III
   - Class IV
   - Fractured anterior tooth

IV. Maxillofacial prosthesis

- Eye

- Ear
- Nose
- Face
- Body defects
  - Cranial
  - Maxillectomy
  - Hemimandibulectomy
  - Finger prosthesis
  - Guiding flange
  - Obturator

V. Implant supported prosthesis

1. Step by step procedures –***Surgical and*** laboratory phase

VI. Other exercises

1. TMJ splints – stabilization appliances, maxillary and Mandibular repositioning appliances
2. Anterior disocclusion appliances
3. Chrome cobalt and acrylic resin stabilization appliances
4. Modification in accommodation of irregularities in dentures
5. Occlusal splints
6. Periodontal splints
7. Precision attachments – custom made
8. Over denture coping
9. Full mouth rehabilitation (by drop wax technique, ceramic build up)
10. TMJ appliances – stabilization appliances

ESSENTIAL SKILLS:

*Key
O – Washes up and observes
A – Assists a senior
PA – Performs procedure under the direct supervision of a senior specialist
PI – Performs independently

The following list of procedures are expected of the post graduate to complete in the post graduate programme under faculty guidance [PA] or independently [PI] . Each of the following procedures should be evaluated for the competencies like critical thinking, patient centered approach, use of evidence based approach, professionalism, systems based practice approach and communication skills of the student. The mentioned numbers denote minimal requirement. However, the head of the department has the discretion to fix the quota and assess them systematically. There may be procedures which the student has observed [O] or assisted [A]. The student can however make his entry into his log book or portfolio wherein he/she can make his comments with remarks of the facilitator in the form of a feedback which would reinforce his learning.

PROCEDURE	CATEGORY			
	O	A	PA	PI
Tooth and tooth surface restoration a) Composites – fillings, laminates, inlay, onlay b) Ceramics – laminates, inlays, onlays c) Glass Ionomer				 5 5 5
CROWNS				

FVC for metal				10
FVC for ceramic				10
Precious metal crown or Galvanoformed crown	1	-	1	5
Intraradicular crowns (central, lateral, canine, premolar, and molar)		-	-	5
Crown as implant supported prosthesis	As many	5	5	5
FIXED PARTIAL DENTURES				
Porcelain fused to metal (anterior and posterior)				10
Multiple abutments – maxillary and Mandibular full arch				5

Incorporation of custom made and prefabricated precision attachments			2	
Adhesive bridge for anterior/posterior		-		5
CAD – CAM Anterior/Posterior FPD	-	-		5
Interim provisional restorations (crowns and FPDs)				for all crowns and bridges
Immediate fixed partial dentures (interim) with ovate pontic		-	-	5
Fixed prosthesis as a retention and rehabilitation means for acquired and congenital defects – maxillofacial Prosthetics				5
Implant supported prosthesis		-		1
Implant – tooth supported prosthesis		-		1
REMOVABLE PARTIAL DENTURE				
Provisional partial denture prosthesis				10
Cast removable partial denture (for Kennedy's Applegate classification with modifications)				3
Removable bridge with precision attachments and Telescopic crowns for anterior and posterior edentulous Spaces				1
Immediate RPD				5
Partial denture for medically compromised and Handicapped patients				2
COMPLETE DENTURES				
Anatomic characterized prosthesis (by using semi adjustable articulator)	-	-		25
Single dentures	-	-		5
Overlay dentures	-	-		5
Interim complete dentures as a treatment prosthesis for abused denture supporting tissues	-	-		5
Complete denture prosthesis (for abnormal ridge relation, ridge form and ridge size)	-	-		5

Complete dentures for patients with TMJsyndromes	-	-		2
Complete dentures for medically compromised and handicapped patients	-	-		2
GERIATRIC PATIENTS				
Handling geriatric patients requiring nutritional counseling, psychological management and management of co-morbitity including xerostomia and systemic problems. Palliative care to elderly.				
IMPLANT SUPPORTED COMPLETE PROSTHESIS				
Implant supported complete prosthesis (maxillary and Mandibular)	-	-		1
MAXILLOFACIAL PROSTHESIS				

e.g. Guiding flange/ obturators/ Speech and palatal lift prosthesis/ Eye/ Ear/ Nose/ Face/Finger/Hand/Foot	5 different types as PI

TMJ SYNDROME MANAGEMENT				
Splints – periodontal, teeth, jaws	-	-	1	1
TMJ supportive and treatment prosthesis	-	-	1	1
Stabilization appliances for maxilla and mandible with freedom to move from IP to CRCP	-	-	-	1
In IP without the freedom to move to CRCP	-	-	-	1
Repositioning appliances, anterior disocclusion appliances	-	-	-	1
Chrome cobalt and acrylic resin stabilization appliances for modification to accommodate for the irregularities in the dentition	-	-	-	1
Occlusal adjustment and occlusal equilibrium appliances	-	-	1	4
FULL MOUTH REHABILITATION				
Full mouth rehabilitation – restoration of esthetics and function of stomatognathic system	-	-	1	2
INTER-DISCIPLINARY TREATMENT MODALITIES				
Inter-disciplinary management – restoration of Oro craniofacial defects for esthetics, phonation, mastication and psychological comforts	-	-	1	2
MANAGEMENT OF FAILED RESTORATION				
Tooth and tooth surface restorations	-	-	-	5

Removable prosthesis	-	-	-	5
Crowns and fixed prosthesis	-	-	-	5
Maxillofacial prosthesis	-	-	-	2
Implant supported prosthesis	-	-	-	1
Occlusal rehabilitation and TMJ syndrome	-	-	-	2
Restoration failures of psychogenic origin	-	-	-	2
Restoration failures to age changes	-	-	-	2

SCHEME OF EXAMINATION:

A. Theory: Part-I : Basic Sciences Paper - **100 Marks**
Part-II : Paper-I, Paper-II & Paper-III - **300 Marks**
(100 Marks for each Paper)

Written examination shall consist of Basic Sciences Paper (Part-I) of three hours duration and should be conducted at the end of First year of ***MDS course. Part 1 examination consists of two essays of 25 marks each and 10 short answers of 5 marks each. Part-II Examination will be conducted at the end of Third year of MDS course. Part-II Examination will consist of Paper-I, Paper-II & Paper-III, each of three hours duration. Paper-I , Paper-II and Paper III shall consist of two long answer questions carrying 25 marks each and five questions carrying 10 marks each. Distribution of topics for each paper will be as follows:***

Part-I : ***Applied Basic Sciences: Applied Anatomy***
Nutrition & Biochemistry, Pathology & Microbiology, virology, Applied Dental anatomy & histology, Oral pathology & oral Microbiology, Adult and geriatric psychology. Applied dental materials.

Part-II

Paper-I : Removable Prosthodontics and Implant supported prosthesis (Implantology), Geriatric dentistry and Cranio facial Prosthodontics
Paper-II : Fixed Prosthodontics, Occlusion, TMJ and esthetics.
Paper-III : Essays (descriptive and analyzing type questions)

**The topics assigned to the different papers are generally evaluated under those sections. However a strict division of the subject may not be possible and some overlapping of topics is inevitable. Students should be prepared to answer overlapping topics.*

A. Practical / Clinical Examination : 200 Marks

1. **Presentation of treated patients and records during their 3 years Training period** 35 Marks

a. C.D. 1 mark
b. R. P.D. 2 marks
c. F.P.D. including single tooth and surface restoration 2 marks
d. I.S.P. 5 marks
e. Occlusal rehabilitation 5 marks
f. T.M.J. 5 marks
g. Maxillofacial Prosthesis 5 marks
h. Pre Clinic Exercises 10 marks

2. Presentation of Clinical Exam CD patient's prosthesis including insertion 75 Marks

1.	Discussion on treatment plan and patient review	10 marks
2.	Tentative jaw relation records	5 marks
3.	Face Bow – transfer	5 marks
4.	Transferring it on articulators	5 marks
5.	Extra oral tracing and securing centric and	15 marks
	protrusive/lateral, record	
6.	Transferring records on articulator and programming.	5 marks
7.	Selection of teeth	5 marks
8.	Arrangement of teeth	10 marks
9.	Waxed up denture trial	10 marks
10.	Check of Fit, insertion and instruction of previously	5 marks
	processed characterised, anatomic complete denture	
	Prosthesis	

ALL STEPS WILL INCLUDE CHAIRSIDE, LAB AND VIVA VOCE

3. Fixed Partial Denture **35 Marks**

a. Case discussion including treatment planning and selection of patient for F.P.D. — 5 Marks
b. Abutment preparation isolation and fluid control — 15 marks
c. Gingival retraction and impressions (conventional/ CAD CAM impressions — 10 marks
d. Cementation of provisional restoration — 5 marks

4. Removable Partial Denture **25 Marks**

a. Surveying and designing of partial dentate cast. — *5 marks*
b. Discussion on components and material selection including occulsal schemes. — *10 marks*

5. Implant supported prosthesis (2nd stage- protocol) ***30 marks***

a. Case discussion including treatment planning and selection of patient for ISP — *10 marks*
b. II stage preparation, Abutment selection, placement, evaluation — *10 marks*
c. Implant impression and making of cast — *10 marks*

B. Viva Voce : **100 Marks**

I. Viva-Voce examination: *80 marks*

All examiners will conduct viva-voce conjointly on candidate's comprehension, analytical approach, expressions, interpretation of data and communication skills. It includes all components of course contents. It includes presentation and discussion on dissertation also.

II. Pedagogy *20 marks*

2. PERIODONTOLOGY:

OBJECTIVES:

The following objectives are laid out to achieve the goals of the course

A) KNOWLEDGE:

Discuss historical perspective to advancement in the subject proper and related topics.

- Describe etiology, pathogenesis, diagnosis and management of common periodontal diseases with emphasis on Indian population
- Familiarize with the biochemical, microbiologic and immunologic genetic aspects of periodontal pathology
- Describe various preventive periodontal measures
- Describe various treatment modalities of periodontal disease from historical aspect to currently available ones
- Describe interrelationship between periodontal disease and various systemic conditions
- Describe periodontal hazards due to estrogenic causes and deleterious habits and prevention of it
- Identify rarities in periodontal disease and environmental/Emotional determinates in a given case
- Recognize conditions that may be outside the area of his/her Speciality/ competence and refer them to an appropriate Specialist
- Decide regarding non-surgical or surgical management of the case
- Update the student by attending courses, conferences and seminars relevant to periodontics or by self-learning process.
- Plan out/ carry out research activity both basic and clinical aspects with the aim of publishing his/her work in scientific journals
- Reach to the public to motivate and educate regarding periodontal disease, its prevention and consequences if not treated
- Plan out epidemiological survey to assess prevalence and incidence of early onset periodontitis and adult periodontitis in Indian population (Region wise)
- Shall develop knowledge, skill in the science and practice of Oral Implantology
- Shall develop teaching skill in the field of Periodontology and Oral Implantology
- Principals of Surgery and Medical Emergencies.
- To sensitize students about inter disciplinary approach towards the soft tissues of the oral cavity with the help of specialist from other departments.

B) SKILLS:

- Take a proper clinical history, thorough examination of intra oral, extra oral, medical history evaluation, advice essential diagnostic procedures and interpret them to come to a reasonable diagnosis
- Effective motivation and education regarding periodontal disease maintenance after the treatment
- Perform both non-surgical & education regarding periodontal disease, maintenance after the treatment
- Perform both non-surgical and surgical procedures independently
- Provide Basic Life Support Service (BLS) recognizes the need for advance life support and does the immediate need for that.
- Human values, ethical practice to communication abilities

- Adopt ethical principles in all aspects of treatment modalities; Professional honesty & integrity are to be fostered. Develop Communication skills to make awareness regarding periodontal disease Apply high moral and ethical standards while carrying out human or animal research, Be humble, accept the limitations in his/her knowledge and skill, and ask for help from colleagues when needed, Respect patients rights and privileges, including patients right to information and right to seek a second opinion.
- To learn the principal of lip repositioning and perio esthetics surgeries.

COURSE CONTENTS:

PART-I:

APPLIED BASIC SCIENCES

APPLIED ANATOMY:

1. Development of the Periodontium
2. Micro and Macro structural anatomy and biology of the periodontal tissues
3. Age changes in the periodontal tissues
4. Anatomy of the Periodontium
   - Macroscopic and microscopic anatomy
   - Blood supply of the Periodontium
   - Lymphatic system of the Periodontium
   - Nerves of the Periodontium
5. Temporomandibular joint, Maxillae and Mandible
6. Tongue, oropharynx
7. Muscles of mastication / Face
8. Blood Supply and Nerve Supply of Head & Neck and Lymphatics.
9. Spaces of Head & Neck

PHYSIOLOGY:

1. Blood
2. Respiratory system – knowledge of the respiratory diseases which are a cause of periodontal diseases (periodontal Medicine)
3. Cardiovascular system
   a. Blood pressure
   b. Normal ECG
   c. Shock
4. Endocrinology – hormonal influences on Periodontium
5. Gastrointestinal system
   a. Salivary secretion – composition, function & regulation
   b. Reproductive physiology
   c. Hormones – Actions and regulations, role in periodontal disease
   d. Family planning methods
6. Nervous system
   a. Pain pathways
   b. Taste – Taste buds, primary taste sensation & pathways for sensation

7. Hemostasis

BIOCHEMISTRY:

1. Basics of carbohydrates, lipids, proteins, vitamins, enzymes and minerals
2. Diet and nutrition and periodontium
3. Biochemical tests and their significance
4. Calcium and phosphorus

PATHOLOGY:

1. Cell structure and metabolism
2. Inflammation and repair, necrosis and degeneration
3. Immunity and hypersensitivity
4. Circulatory disturbances – edema, hemorrhage, shock, thrombosis, embolism, infarction and hypertension
5. Disturbances of nutrition
6. Diabetes mellitus
7. Cellular growth and differentiation, regulation
8. Lab investigations
9. Blood

MICROBIOLOGY:

1. General bacteriology
   a. Identification of bacteria
   b. Culture media and methods
   c. Sterilization and disinfection
2. Immunology and Infection
3. Systemic bacteriology with special emphasis on oral microbiology – staphylococci, genus actinomyces and other filamentous bacteria and actinobacillus actinomycetum comitans
4. Virology
   a. General properties of viruses
   b. Herpes, Hepatitis, virus, HIV virus
5. Mycology
   a. Candidiasis
6. Applied microbiology
7. Diagnostic microbiology and immunology, hospital infections and management

PHARMACOLOGY:

1. General pharmacology
   a. Definitions – Pharmacokinetics with clinical applications, routes of administration including local drug delivery in Periodontics
   b. Adverse drug reactions and drug interactions
2. Detailed pharmacology of
   a. Analgesics – opiod and nonopiod
   b. Local anesthetics
   c. Haematinics and coagulants, Anticoagulants
   d. Vit D and Calcium preparations
   e. Antidiabetics drugs
   f. Steroids
   g. Antibiotics
   h. Antihypertensive
   i. Immunosuppressive drugs and their effects on oral tissues
   j. Antiepileptic drugs
3. Brief pharmacology, dental use and adverse effects of
   a. General anesthetics
   b. Antipsychotics
   c. Antidepressants
   d. Anxiolytic drugs
   e. Sedatives
   f. Antiepileptics
   g. Antihypertensives
   h. Antianginal drugs
   i. Diuretics

   j. Hormones
   k. Pre-anesthetic medications
4. Drugs used in Bronchial asthma, cough
5. Drug therapy of
   a. Emergencies
   b. Seizures
   c. Anaphylaxis
   d. Bleeding
   e. Shock
   f. Diabetic ketoacidosis
   g. Acute addisonian crisis
6. Dental Pharmacology
   a. Antiseptics
   b. Astringents
   c. Sialogogues
   d. Disclosing agents
   e. Antiplaque agents
7. Fluoride pharmacology

BIOSTATISTICS:

1. Introduction, definition and branches of biostatistics
2. Collection of data, sampling, types, bias and errors
3. Compiling data-graphs and charts
4. Measures of central tendency (mean, median and mode), standard deviation and variability
5. Tests of significance (chi square test, t-test and z-test)
   Null hypothesis

PART II

PAPER 1

ETIOPATHOGENESIS:

1. Classification of periodontal diseases and conditions
2. Epidemiology of gingival and periodontal diseases
3. Defense mechanisms of gingival
4. Periodontal microbiology
5. Basic concepts of inflammation and immunity
6. Microbial interactions with the host in periodontal diseases
7. Pathogenesis of plaque associated periodontal diseases
8. Dental calculus
9. Role of iatrogenic and other local factors
10. Genetic factors associated with periodontal diseases
11. Influence of systemic diseases and disorders of the periodontium
12. Role of environmental factors in the etiology of periodontal disease
13. Stress and periodontal diseases
14. Occlusion and periodontal diseases
15. Smoking and tobacco in the etiology of periodontal diseases
16. AIDS and periodontium
17. Periodontal medicine
18. Dentinal hypersensitivity

PAPER-II

CLINICAL AND THERAPEUTIC PERIODONTOLOGY AND ORAL IMPLANTOLOGY

Please note:
Clinical periodontology includes gingival diseases, periodontal diseases, periodontal instrumentation, diagnosis, prognosis and treatment of periodontal diseases.

(i) GINGIVAL DISEASES

1. Gingival inflammation
2. Clinical features of gingivitis
3. Gingival enlargement
4. Acute gingival infections
5. Desquamative gingivitis and oral mucous membrane diseases
6. Gingival diseases in the childhood

(ii) PERIODONTAL DISEASES

1. Periodontal pocket
2. Bone loss and patterns of bone destruction
3. Periodontal response to external forces
4. Masticatory system disorders
5. Chronic periodontitis
6. Aggressive periodontitis
7. Necrotising ulcerative periodontitis
8. Interdisciplinary approaches
   - Orthodontic
   - Endodontic

(iii) TREATMENT OF PERIODONTAL DISEASES

A. History, examination, diagnosis, prognosis and treatment planning
   1. Clinical diagnosis
   2. Radiographic and other aids in the diagnosis of periodontal diseases
   3. Advanced diagnostic techniques
   4. Risk assessment
   5. Determination of prognosis
   6. Treatment plan
   7. Rationale for periodontal treatment
   8. General principles of anti-infective therapy with special emphasis on infection control in periodontal practice
   9. Halitosis and its treatment
   10. Bruxism and its treatment

B. Periodontal instrumentation
   1. Periodontal Instruments
   2. Principles of periodontal instrumentation

C. Periodontal therapy
   1. Preparation of tooth surface
   2. Plaque control
   3. Anti microbial and other drugs used in periodontal therapy and wasting diseases of teeth
   4. Periodontal management of HIV infected patients
   5. Occlusal evaluation and therapy in the management of periodontal diseases
   6. Role of orthodontics as an adjunct to periodontal therapy
   7. Special emphasis on precautions and treatment for medically compromised patients
   8. Periodontal splints

9. Management of dentinal hypersensitivity

D. Periodontal surgical phase – special emphasis on drug prescription
   1. General principles of periodontal surgery
   2. Surgical anatomy of periodontium and related structures
   3. Gingival curettage
   4. Gingivectomy technique
   5. Treatment of gingival enlargements
   6. Periodontal flap
   7. Osseous surgery (resective and regenerative)
   8. Furcation; Problem and its management
   9. The periodontic – endodontic continuum
   10. Periodontic plastic and esthetic surgery
   11. Recent advances in surgical techniques

E. Future directions and controversial questions in periodontal therapy
   1. Future directions for infection control
   2. Research directions in regenerative therapy
   3. Future directions in anti-inflammatory therapy
   4. Future directions in measurement of periodontal diseases

F. Periodontal maintenance phase
   1. Supportive periodontal treatment
   2. Results of periodontal treatment

(iv) ORAL IMPLANTOLOGY

1. Introduction and historical review
2. Biological, clinical and surgical aspects of dental implants
3. Diagnosis and treatment planning
4. Implant surgery
5. Prosthetic aspects of dental implants
6. Diagnosis and treatment of Peri implant complications
7. Special emphasis on plaque control measures in implant patients
8. Maintenance phase

(v) MANAGEMENT OF MEDICAL EMERGENCIES IN PERIODONTAL PRACTICE

Periodontology treatment should be practiced by various treatment plans and more number of patients to establish skill for diagnosis and treatment and after care with bio-mechanical, biological, bio-esthetics, bio-phonetics and all treatment should be carried out in more number for developing clinical skill.

TEACHING / LEARNING ACTIVITIES:

The post graduate is expected to complete the following at the end of :

S.NO	Year Wise	ACTIVITIES WORKS TO BE DONE
1.	**Module 1 (First Year)**	Orientation to the PG program **Pre-clinical work (4 months)** **a. Dental** 1. Practice of incisions and suturing techniques on the typodont models. 2. Fabrication of bite guards and splints. 3. Occlusal adjustment on the casts mounted on the

		articulator 4. X-ray techniques and interpretation. 5. Local anaesthetic techniques. 6. Identification of Common Periodontal Instruments. 7. To learn science of Periodontal Instruments maintance (Sharpening , Sterlization and Storate) 8. Concept of Biological width a. Typhodont Exercise (i) Class II Filling with Band and Wedge Application (ii) Crown cuttings **b. Medical** 1. Basic diagnostic microbiology and immunology, collection and handling of sample and culture techniques. 2. Introduction to genetics, bioinformatics. 3. Basic understanding of cell biology and immunological diseases. **Clinical work** 1. Applied periodontal indices 10 cases 2. Scaling and root planning:- with Proper written history a. Manual 20 Cases b. Ultrasonic 20 Cases 3. Observation / assessment of all periodontal procedures including implants
2.	**Module 2** (**First Year**)	1. Interpretation of various bio-chemical investigations. 2. Practical training and handling medical emergencies and basic life support devices. 3. Basic biostatistics – Surveying and data analysis. **Clinical** 1. Case history and treatment planning 10 cases 2. Root planning 50 cases 3. Observation / assessment of all periodontal procedures including implant. 4. Selection of topic for Library dissertation and submission of Dissertation Synopsis.
3.	**Module 3** (**First Year**)	Minor surgical cases 20 cases (i) Gingival Depigmentation 3 Cases (ii) Gingival Curettage no limits (iii) ENAP 1 Case (iv) Gingivectomy/ Gingivoplasty 5 cases (v) Operculectomy 3 cases Poster Presentation at the Speciality conference
4.	**Module 4** (**Second Year**)	**Clinical work** 1. Case history and treatment planning 10 cases 2. Occlusal adjustments 10 cases 3. Perio splints 10 cases 4. Local drug delivery techniques 5 cases 5. Screening cases for dissertation
5.	**Module 5** (**Second Year**)	1. Periodontal surgical procedures. a. Basic flap procedures 20 cases 2. Periodontal plastic and esthetic 10 cases a. Increasing width of attached gingival 5 cases

		b. Root coverage procedures / Papilla Preservation and Reconstruction 5 cases c. Crown lengthening procedures 5 cases d. Frenectomy 5 cases e. Vestibuloplasty 5 cases 3. Furcation treatment (Hemisection, Rootsection, Tunelling) 5 cases 4. Surgical closure of diastema. 2 cases
6.	**Module 6** (**Third Year**)	1. Ridge augmentation procedures 5 cases 2. Implants Placements and monitoring 5 cases 3. Sinus lift procedures 2 cases 4. Case selection, preparation and investigation of implants. 5. Interdisciplinary Periodontics 2 each (i) Ortho – Perio (ii) Endo – Perio (iii) Restorative Perio (iv) Preprosthetic (v) Crown Prep 6. Osseous Surgery 2 each (i) Resective (ii) Regenerative 7. Scientific paper/ poster presentation at the conference.
7.	**Module 7** (**Third Year**)	**Clinical work** 1. Flap surgeries & regenerative techniques 25 cases (using various grafts & barrier membranes) 2. Assistance / observation of advanced surgical procedure 5 each 3. Micro Surgery 5 each 4. Record maintenance & follow-up of all treated cases including implants. 5. Submission of dissertation – 6 months before completion of III year. 6. Scientific paper presentation at conferences.
8.	**Module 8** (**Third Year**)	1. Refining of surgical skills. 2. Publication of an article in a scientific journal. 3. Preparation for final exams.
9.	**Module 9** (**Third Year**)	1. Preparation for final exams. 2. University exam

Note: Maintenance of Work Diary / Check list / Log books as prescribed.

ASSESSMENT EXAMINATION:
In addition to regular evaluation, log book etc., Assessment examination should be conducted after every 3 modules & progress of the student monitored.

MONITORING LEARNING PROGRESS:
It is essential to monitor the learning progress of each candidate through continuous appraisal and regular assessment. It not only helps teachers to evaluate students, but also students to evaluate themselves. The monitoring is to be done by the staff of the department based on participation of students in various teaching / learning activities. It may be structured and assessment be done using checklists that assess various aspects.

SCHEME OF EXAMINATION:

A. Theory: Part-I: Basic Sciences Paper - **100 Marks**

Part-II: Paper-I, Paper-II & Paper-III - **300 Marks** (100 Marks for each Paper)

Written examination shall consist of Basic Sciences Paper (Part-I) of three hours duration and should be conducted at the end of First year of MDS course. Part-II Examination will be conducted at the end of Third year of MDS course. Part-II Examination will consist of Paper-I, Paper-II & Paper-III, each of three hours duration. Paper-I & Paper-II shall consist of two long answer questions carrying 25 marks each and five questions carrying 10 marks each. Paper-III will be on Essays. In Paper-III three Questions will be given and student has to answer any two questions. Each question carries 50 marks. Questions on recent advances may be asked in any or all the papers. Distribution of topics for each paper will be as follows:

Part- I : Applied Basic Sciences: Applied Anatomy, Physiology, & Biochemistry, Pathology, Microbiology, Pharmacology, Research Methodology and Biostatistics.

Part-II

Paper I: Normal Periodontal structure, Etiology & Pathogenesis of Periodontal diseases, epidemiology as related to Periodontics

Paper II: Periodontal diagnosis, therapy & Oral Implantology

Paper III: Essays (descriptive and analyzing type questions)

**Part- I :* *The topics assigned to the different papers are generally evaluated under those sections. However a strict division of the subject may not be possible and some overlapping of topics is inevitable. Students should be prepared to answer overlapping topics*.

B. Practical / Clinical Examination : 200 Marks

The clinical examination shall be of two days duration

1st day

Case discussion

- Long case - One
- Short case - One

Periodontal surgery – Periodontal Surgery on a previously prepared case after getting approval from the examiners

2nd day

Post-surgical review and discussion of the case treated on the 1st day

Presentation of dissertation & discussion

All the examiners shall participate in all the aspects of clinical examinations / Viva Voce

Distribution of Marks for Clinical examination (recommended)

a) Long Case discussion	75		
b) 1 short case	25		
c) Periodontal surgery	1.	Anesthesia	10
	2.	Incision	20
	3.	Post Surgery Evaluation	25
	4.	Sutures	10

	5.	Pack (if any)	10
Post – operative review		25	
Total		**200**	

C. Viva Voce : 100 Marks

i. Viva-Voce examination: 80 marks

All examiners will conduct viva-voce conjointly on candidate's comprehension, analytical approach, expression, interpretation of data and communication skills. It includes all components of course contents. It includes presentation and discussion on dissertation also.

ii. Pedagogy Exercise : 20 marks

A topic will be given to each candidate in the beginning of clinical examination. He/she is asked to make a presentation on the topic for 8-10 minutes.

3. ORAL AND MAXILLOFACIAL SURGERY

OBJECTIVES:

The training program in Oral and Maxillofacial Surgery is structured to achieve the following five objectives-

- Knowledge
- Skills
- Attitude
- Communicative skills and ability
- Research

Knowledge:

- To have acquired adequate knowledge and understanding of the etiology, pathophysiology and diagnosis, treatment planning of various common oral and Maxillofacial surgical problems both minor and major in nature
- To have understood the general surgical principles like pre and post surgical management, particularly evaluation, post surgical care, fluid and electrolyte management, blood transfusion and post surgical pain management.
- Understanding of basic sciences relevant to practice of oral and maxillofacial surgery
- Able to identify social, cultural, economic, genetic and environmental factors and their relevance to disease process management in the oral and Maxillofacial region.
- Essential knowledge of personal hygiene and infection control, prevention of cross infection and safe disposal of hospital waste keeping in view the high prevalence of hepatitis and HIV.

Skills:

- To obtain proper clinical history, methodical examination of the patient, perform essential diagnostic procedures and order relevant laboratory tests and interpret them and to arrive at a reasonable diagnosis about the surgical condition.
- To perform with competence minor oral surgical procedures and common maxillofacial surgery. To treat both surgically and medically the problems of the oral and Maxillofacial and the related area.
- Capable of providing care for maxillofacial surgery patients.

Attitude:

- Develop attitude to adopt ethical principles in all aspect of surgical practice, professional honesty and integrity are to be fostered. Surgical care is to be delivered irrespective of the social status, caste, creed or religion of the patient.
- Willing to share the knowledge and clinical experience with professional colleagues.
- Willing to adopt new techniques of surgical management developed from time to time based on scientific research which are in the best interest of the patient
- Respect patient right and privileges, including patients right to information and right to seek a second opinion.
- Develop attitude to seek opinion from an allied medical and dental specialists as and when required.

Communication Skills:

- Develop adequate communication skills particularly with the patients giving them the various options available to manage a particular surgical problem and obtain a true informed consent from them for the most appropriate treatment available at that point of time
- Develop the ability to communicate with professional colleagues.
- Develop ability to teach undergraduates.

COURSE CONTENT:

The speciality of Oral & Maxillofacial Surgery deals with the diagnosis and management of the diseases of stomatognathic system, jaw bones, cranio-maxillofacial region, salivary glands and temporomandibular joints etc. Within this framework it also supports many vital organs like eye, oropharynx, nasopharynx and major blood vessels and nerves. The traumatic injuries of maxillofacial skeleton are independently managed by Oral & Maxillofacial Surgeons. Whenever there are orbital injuries the ophthalmologists are trained only to tackle injuries of the eye ball (globe) but if there are associated injuries of the orbital skeleton, the Maxillofacial Surgeon is involved in its re-construction. Similarly, nasal bone fracture may be managed by ENT surgeons. Most of the time nasal bone fractures are associated with fractures of the maxilla, mandible and zygomatic bones which are being managed by Oral & Maxillofacial Surgeons. The maxillofacial facial injuries at times are associated with head injuries also. The Oral & maxillofacial Surgeon is involved in the management of cleft lip & cleft palate, orthognathic surgery, micro vascular surgery, reconstructive and oncological surgical procedures of maxillofacial region. The speciality of Oral & Maxillofacial Surgery is a multi disciplinary speciality and needs close working in co-ordination with Neurosurgeons, Oncosurgeons, Opthalmologists, ENT Surgeons and Plastic Surgeons. The Oral & Maxillofacial Surgeons, Ophthalmologist, ENT Surgeons, Plastic Surgeons, Neuro-Surgeons and Oncologists complement each other by performing Surgical Procedures with their respective expertise and knowledge thereby benefiting the patients and students of the respective specialities.

The program outline addresses both the knowledge needed in Oral and Maxillofacial Surgery and allied medical specialties in its scope. A minimum of three years of formal training through a graded system of education as specified will equip the trainee with skill and knowledge at its completion to be able to practice basic oral and Maxillofacial surgery competently and have the ability to intelligently pursue further apprenticeship towards advanced Maxillofacial surgery.

The topics are considered as under:-

A) Applied Basic sciences
B) Oral and Maxillofacial surgery
C) Allied specialties

A) Applied Basic Sciences:

Applied Anatomy, Physiology, Biochemistry, General and Oral Pathology and Microbiology, Pharmacology and Knowledge in Basic Statistics.

Applied Anatomy:

1. Surgical anatomy of the scalp, temple and face
2. Anatomy of the triangles of neck and deep structures of the neck
3. Cranial and facial bones and its surrounding soft tissues with its applied aspects in maxillofacial injuries.
4. Muscles of head and neck; chest , lower and upper extremities (in consideration to grafts/flaps)
5. Arterial supply, venous drainage and lymphatics of head and neck

6. Congenital abnormalities of the head and neck
7. Surgical anatomy of the cranial nerves
8. Anatomy of the tongue and its applied aspects
9. Surgical anatomy of the temporal and infratemporal regions
10. Anatomy and its applied aspects of salivary glands, pharynx, thyroid and parathyroid gland, larynx, trachea, esophagus
11. Tooth eruption, morphology, and occlusion.
12. Surgical anatomy of the nose.
13. The structure and function of the brain including surgical anatomy of intra cranial venous sinuses.
14. Autonomous nervous system of head and neck
15. Functional anatomy of mastication, deglutition, speech, respiration and circulation
16. Development of face, paranasal sinuses and associated structures and their anomalies
17. TMJ: surgical anatomy and function

Physiology:

1. **Nervous system**
   - Physiology of nerve conduction, pain pathway, sympathetic and parasympathetic nervous system, hypothalamus and mechanism of controlling body temperature
2. **Blood**
   - Composition
   - Haemostasis, various blood dyscrasias and management of patients with the same
   - Hemorrhage and its control
   - Capillary and lymphatic circulation.
   - Blood grouping, transfusing procedures.
3. **Digestive system**
   - Saliva - composition and functions of saliva
   - Mastication, deglutition, digestion, assimilation
   - Urine formation, normal and abnormal constituents
4. **Respiration**
   - Control of ventilation, anoxia, asphyxia, artificial respiration
   - Hypoxia – types and management
5. **CardioVascular System**
   - Cardiac cycle,
   - Shock
   - Heart sounds,
   - Blood pressure,
   - Hypertension:
6. **Endocrinology**
   - General endocrinal activity and disorder relating to thyroid gland,
   - Parathyroid gland, adrenal gland, pituitary gland, pancreas and gonads:
   - Metabolism of calcium

7. **Nutrition**
   - General principles of a balanced diet, effect of dietary deficiency, protein energy malnutrition, Kwashiorkor, Marasmus.
   - Fluid and Electrolytic balance in maintaining haemostasis and significance in minor and major surgical procedures.

Biochemistry:

- General principles governing the various biological activities of the body, such as osmotic pressure, electrolytes, dissociation, oxidation, reduction etc.
- General composition of the body
- Intermediary metabolism
- Carbohydrates, proteins, lipids, and their metabolism
- Nucleoproteins, nucleic acid and nucleotides and their metabolism
- Enzymes, vitamins and minerals
- Hormones
- Body and other fluids.
- Metabolism of inorganic elements.
- Detoxification in the body.
- Antimetabolites.

Pathology:

1. **Inflammation –**
   - Repair and regeneration, necrosis and gangrene
   - Role of component system in acute inflammation,
   - Role of arachidonic acid and its metabolites in acute inflammation,
   - Growth factors in acute inflammation
   - Role of molecular events in cell growth and intercellular signaling cell surface receptors
   - Role of NSAIDs in inflammation,
   - Cellular changes in radiation injury and its manifestation:
2. **Haemostasis**
   - Role of endothelium in thrombogenesis,
   - Arterial and venous thrombi,
   - Disseminated Intravascular coagulation
3. **Shock:**
   - Pathogenesis of hemorrhagic, neurogenic, septic, cardiogenic shock
   - Circulatory disturbances, ischemia, hyperemia, venous congestion, edema, infarction
4. **Chromosomal abnormalities:**
   - Marfans Syndrome, Ehler's Danlos Syndrome, Fragile X- Syndrome
5. **Hypersensitivity:**
   - Anaphylaxis, type 2 hypersensitivity, type 3 hyper sensitivity and cell mediated reaction and its clinical importance, systemic lupus erythematosus.
   - Infection and infective granulomas.
6. **Neoplasia:**
   - Classification of tumors.
   - Carcinogenesis and carcinogens- chemical, viral and microbial
   - Grading and staging of cancers, tumor Angiogenesis, Paraneoplastic syndrome, spread of tumors
   - Characteristics of benign and malignant tumors
7. **Others:**
   - Sex linked agammaglobulinemia.
   - AIDS
   - Management of immuno deficiency patients requiring surgical procedures
   - De George Syndrome

- Ghons complex, post primary pulmonary tuberculosis – pathology and pathogenesis.

Oral Pathology:

- Developmental disturbances of oral and Para oral structures
- Regressive changes of teeth.
- Bacterial, viral and mycotic infections of oral cavity
- Dental caries,, diseases of pulp and periapical tissues
- Physical and chemical injuries of the oral cavity
- Oral manifestations of metabolic and endocrinal disturbances
- Diseases of jawbones and TMJ
- Diseases of blood and blood forming organs in relation to oral cavity
- Cysts of the oral cavity
- Salivary gland diseases
- Role of laboratory investigations in oral surgery

Microbiology:

- Immunity
- Knowledge of organisms commonly associated with diseases of oral cavity.
- Morphology cultural characteristics of strepto, staphylo, pneumo, gono, meningo, clostridium group of organisms, spirochetes, organisms of TB, leprosy, diphtheria, actinomycosis and moniliasis
- Hepatitis B and its prophylaxis
- Culture and sensitivity test
- Laboratory determinations
- Blood groups, blood matching, RBC and WBC count
- Bleeding and clotting time etc, smears and cultures,
- Urine analysis and cultures.

Applied Pharmacology and Therapeutics:

1. Definition of terminologies used
2. Dosage and mode of administration of drugs.
3. Action and fate of drugs in the body
4. Drug addiction, tolerance and hypersensitivity reactions.
5. Drugs acting on the CNS
6. General and local anesthetics, hypnotics, analeptics, and tranquilizers.
7. Chemo therapeutics and antibiotics
8. Analgesics and antipyretics
9. Antitubercular and antisyphilitic drugs.
10. Antiseptics, sialogogues and antisialogogues
11. Haematinics
12. Antidiabetics
13. Vitamins A, B-complex, C, D, E, K

B) Oral and Maxillofacial Surgery:

- Evolution of Maxillofacial surgery.
- Diagnosis, history taking, clinical examination, investigations.
- Informed consent/medico-legal issues.
- Concept of essential drugs and rational use of drugs.

- Communication skills with patients- understanding, clarity in communication, compassionate explanations and giving emotional support at the time of suffering and bereavement
- Principles of surgical audit – understanding the audit of process and outcome. Methods adopted for the same. Basic statistics.
- Principles of evidence based surgery- understanding journal based literature study; the value of textbook, reference book articles, value of review articles; original articles and their critical assessment, understanding the value of retrospective, prospective, randomized control and blinded studies, understanding the principles and the meaning of various Bio-statistical tests applied in these studies.
- Principles of surgery- developing a surgical diagnosis, basic necessities for surgery, aseptic technique, incisions, flap designs, tissue handling, hemostasis, dead space management, decontamination and debridement, suturing, edema control, patient general health and nutrition.
- Medical emergencies – Prevention and management of altered consciousness, hyper sensitivity reaction, chest discomfort, respiratory difficulty.
- Pre operative workup – Concept of fitness for surgery; basic medical work up; work up in special situation like diabetes, renal failure, cardiac and respiratory illness; risk stratification
- Surgical sutures, drains
- Post operative care- concept of recovery room care, Airway management, Assessment of Wakefulness, management of cardio vascular instability in this period, Criteria for shifting to the ward, pain management
- Wound management- Wound healing, factors influencing healing, basic surgical techniques, Properties of suture materials, appropriate use of sutures.
- Surgical Infections – Asepsis and antisepsis, Microbiological principles, Rational use of antibiotics, special infections like Synergistic Gangrene and Diabetic foot infection, Hepatitis and HIV infection and cross infection.
- Airway obstruction/management – Anatomy of the airway, principles of keeping the airway patent, mouth to mouth resuscitation, Oropharyngeal airway, endotracheal intubation, Cricothyroidectomy, Tracheostomy.
- Anesthesia – stages of Anesthesia, pharmacology of inhalation, intravenous and regional anesthetics, muscle relaxants.
- Facial pain; Facial palsy and nerve injuries.
- Pain control – acute and chronic pain, cancer and non-cancer pain, patient controlled analgesia
- General patient management – competence in physical assessment of patients of surgery, competence in evaluation of patients presenting with acute injury, particularly to maxillofacial region. Competence in the evaluation of management of patients for Anesthesia
- Clinical oral surgery – all aspects of dento alveolar surgery
- Pre-prosthetic surgery – A wide range of surgical reconstructive procedures involving their hard and soft tissues of the edentulous jaws.
- Temporomandibular joint disorders – TMJ disorders and their sequelae need expert evaluation, assessment and management. It is preferable to be familiar with diagnostic and therapeutic arthroscopic surgery procedures.
- Tissue grafting – Understanding of the biological mechanisms involved in autogenous and heterogeneous tissue grafting.
- Reconstructive oral and maxillofacial surgery – hard tissue and soft tissue reconstruction.
- Cyst and tumors of head and neck region and their management – including principles of tumor surgery, giant cell lesion of jaw bones, fibro osseous lesions of jaw.

- Neurological disorders of maxillofacial region-diagnosis and management of Trigeminal Neuralgia, MPDS, Bells palsy, Frey's Syndrome, Nerve injuries
- Maxillofacial trauma – basic principles of treatment, primary care, diagnosis and management of hard and soft tissue injuries, Comprehensive management including polytrauma patients
- Assessment of trauma-multiple injuries patient, closed abdominal and chest injuries, penetrating injuries, pelvic fractures, urological injuries, vascular injuries.
- Orthognathic surgery – The trainee must be familiar with the assessment and correcting of jaw deformities
- Laser surgery – The application of laser technology in the surgical treatment of lesions amenable to such therapy
- Distraction osteogenesis in maxillofacial region.
- Cryosurgeries – Principles, the application of cryosurgery in the surgical management of lesions amenable to such surgeries.
- Cleft lip and palate surgery- detailed knowledge of the development of the face, head and neck, diagnosis and treatment planning, Current concepts in the management of cleft lip and palate deformity, knowledge of nasal endoscopy and other diagnostic techniques in the evaluation of speech and hearing, concept of multi disciplinary team management.
- Aesthetic facial surgery – detailed knowledge of structures of face & neck including skin and underlying soft tissues, diagnosis and treatment planning of deformities and conditions affecting facial skin, underlying facial muscles, bone, eyelids, external ear etc., surgical management of post acne scaring, face lift, blepharoplasty, otoplasty, facial bone recountouring etc.
- Craniofacial surgery – basic knowledge of developmental anomalies of face, head and neck, basics concept in the diagnosis and planning of various head and neck anomalies including facial cleft, craniosynostosis, syndromes, etc., Current concepts in the management of craniofacial anomalies.
- Head and neck oncology – understanding of the principles of management of head and neck oncology including various pre cancerous lesions, Experience in the surgical techniques of reconstruction following ablative surgery.
- Micro vascular surgery.
- Implantology – principles, surgical procedures for insertion of various types of implants.
- Maxillofacial radiology/ radio diagnosis
- Other diagnostic methods and imaging techniques

C) Allied Specialties:

- General medicine: General assessment of the patient including children with special emphasis on cardiovascular diseases, endocrinal, metabolic respiratory and renal diseases, Blood dyscrasias
- General surgery: Principles of general surgery, exposure to common general surgical procedures.
- Neuro – surgery: Evaluation of a patient with head injury, knowledge & exposure of various Neuro – surgical procedures
- ENT/Ophthalmology: Examination of ear, nose, throat, exposure to ENT surgical procedures, ophthalmic examination and evaluation, exposure to ophthalmic surgical procedures.

- Orthopedic: basic principles of orthopedic surgery, bone diseases and trauma as relevant to Maxillofacial surgery, interpretation of radiographs, CT, MRI and ultrasound
- Anesthesiology: Evaluation of patients for GA technique, general anesthetic drugs use and complications, management of emergencies, various IV sedation techniques.
- Plastic Surgery- Basic Principles

TEACHING / LEARNING ACTIVITIES:

The post graduate is expected to complete the following at the end of :

I Year

Study ofapplied basic sciences including practicals (wherever necessary), basic computer sciences, exodontia, seminars on basic topics, selection of dissertation topic, library assignment topic, attending O.T, ward rounds, Medical Record keeping, Pre-clinical exercises, preparation of synopsis and its submission within the six months after admission to the university as per calendar of events.

Rotation and postings in other departments:

General medicine	- 1 month
General surgery	- 1 month
Ophthalmology	- 15 days
Neuro Surgery	- 15 days
ENT	- 15 days
Orthopedic	- 15 days
Plastic Surgery	- 15 days
Casualty	- 15 days
Anesthesia (ICU)	- 15 days
Radiology (CT, MRI, USG)	- 15 days

II Year

- Minor oral surgery and higher surgical training
- Submission of library assignment
- Oncologyposting – 1 month

III Year

- Maxillofacial surgery
- Submission of dissertation to the university, six months before the final examination.

It is desirable to enter general surgical skills and operative procedures that are observed, assisted or performed in the log book in the format as given below:-

Sl.No	Procedure	Category	Number
1	Injection I.M. and I.V.	PI	50, 20
2	Minor suturing and removal of sutures	PI	N,A
3	Incision & drainage of an abscess	PI	10
4	Surgical extraction	PI	15
5	Impacted teeth	PI, A	30,20

6	Pre prosthetic surgery- corrective procedures ridge extension ridge reconstruction	 PI A A	 10 3 3
7	OAF closure	PI, A	3,2
8	Cyst enuleation	PI,A	5,5
9	Mandibular fractures	PI,A	10,10
10	Peri-apical surgery	PI,A	5
11	Infection management	PI,A	3,3
12	Biopsy procedures	PI, A	10, 3
13	Removal of salivary calculi	A	3
14	Benign tumors	A	3,3
15	mid face fractures	PI,A	3,5
16	Implants	PI,A	5,5
17	Tracheotomy	A	2
18	Skin grafts	PI,A	2,2
19	Orthognathic surgery	A,O	3,5
20	Harvesting bone & cartilage grafts Iliac crest Rib Calvarial Fibula	A,O A,O A,O A,O	3,5 3,3 2,2 2,2
21	T.M. Joint surgery	A	3
22	Jaw resections	A,O	3,5
23	Onco surgery	A,O	3,3
24	Micro vascular anastomosis	A,O	2,2
25	Cleft lip & palate	A,O	3,5
26	Distraction osteogenesis	A,O	2,3
27	Rhinoplasty	A,O	2,3
28	Access osteotomies and base of skull surgeries	A,O	1,3
29	Emergency Management for OMFS Patients in Casualty / Accident & Emergency	PI,O	5,5

PI:- Performed Independently
A:- Assisted
O:- Observed

Monitoring Learning Progress:

It is essential to monitor the learning progress to each candidate through continuous appraisal and regular assessment. It not only helps teachers to evaluate students, but also students to evaluate themselves. The monitoring to be done by the staff of the department based on participation of students in various teaching / learning activities. It may be structured and assessment be done using checklists that assess various aspects. Checklists are given in Section IV.

Paper wise distribution of syllabus:

PART- I :

Applied Basic Sciences

PART-II:

Paper– I:Minor Oral Surgery and Maxillofacial Trauma

Minor Oral Surgery:

- **Principles of Surgery**: Developing A Surgical Diagnosis, Basic Necessities For Surgery, Aseptic Technique, Incisions, Flap Design Tissue Handling, Haemostasis, Dead Space Management, Decontamination And Debridement, Suturing, Oedema Control, Patient General Health And Nutrition.
- **Medical Emergencies**: Prevention and management of altered cons-ciousness (syncope, orthostatic hypotension, seizures, diabetes mellitus, adrenal insufficiency), hypersensitivity reactions, chest discomfort, and respiratory difficulty.
- **Examination and Diagnosis**: Clinical history, physical and radiographic, clinical and laboratory diagnosis, oral manifestations of systemic diseases, implications of systemic diseases in surgical patients.
- **Haemorrhage and Shock**: Applied physiology, clinical abnormalities of coagulation, extra vascular hemorrhage, and hemorrhagic lesions, management of secondary hemorrhage, shock.
- **Exodontia**: Principles of extraction, indications and contraindications, types of extraction, complications and their management, principles of elevators and elevators used in oral surgery.
- **Impaction:** Surgical anatomy, classification, indications and contraindications, diagnosis, procedures, complications and their management.
- **Surgical aids to eruption of teeth**: Surgical exposure of unerupted teeth, surgical repositioning of partially erupted teeth.
- **Transplantation of teetH**
- **Surgical Endodontics:** Indications and contraindications, diagnosis, procedures of periradicular surgery
- **Preprosthetic Surgery:** Requirements, types (alvoloplasty, tuberosity reduction, mylohyoid ridge reduction, genial reduction, removal of exostosis, vestibuloplasty)
- **Procedures to Improve Alveolar Soft Tissues**: Hypermobile tissues- operative / sclerosing method, epulis fissuratum, frenectomy and frenotomy
- **Infectionsof Head and Neck:** Odontogenic and non Odontogenic infections, factors affecting spread of infection, diagnosis and differential diagnosis, management of facial space infections, Ludwig angina, cavernous sinus thrombosis.
- **Chronic infections of the jaws:** Osteomyelitis (types, etiology, pathogenesis, management) osteoradionecrosis
- **Maxillary Sinus:** Maxillary sinusitis – types, pathology, treatment, closure of Oro – antral fistula, Caldwell- luc operation
- **Cysts of the Orofacial Region:** Classification, diagnosis, management of OKC, dentigerous, radicular, non Odontogenic, ranula
- **Neurological disorders of the Maxillofacial Region:** Diagnosis and management of trigeminal neuralgia, MPDS, bell's palsy, Frey's syndrome, nerve injuries.
- **Implantology**: Definition, classification, indications and contraindications, advantages and disadvantages, surgical procedure.
- **Anesthesia**
  Local Anesthesia**:**
  Classification of local anesthetic drugs, mode of action, indications and contra indications, advantages and disadvantages, techniques, complications and their management.

General Anesthesia:
Classification, stages of GA, mechanism of action, indications, and contra indications, advantages and disadvantages, post anesthetic complications and emergencies, anesthetic for dental procedures in children, pre medication, conscious sedation, legal aspects for GA

Maxillofacial Trauma:

- Surgical Anatomy of Head and Neck.
- Etiology of Injury.
- Basic Principles of Treatment
- Primary Care: resuscitation, establishment of airway, management of hemorrhage, management of head injuries and admission to hospital.
- Diagnosis: clinical, radiological
- Soft Tissue Injury of Face and Scalp: classification and management of soft tissue wounds, injuries to structure requiring special treatment.
- Dento Alveolar Fractures: examination and diagnosis, classification, treatment, prevention.
- Mandibular Fractures: classification, examination and diagnosis, general principles of treatment, complications and their management
- Fracture of Zygomatic Complex: classification, examination and diagnosis, general principles of treatment, complications and their management.
- Orbital Fractures: blow out fractures
- Nasal Fractures
- Fractures of Middle Third of the Facial Skeleton: emergency care, fracture of maxilla, and treatment of le fort I, II, III, fractures of Naso orbito ethmoidal region.
- Opthalmic Injuries: minor injuries, non-perforating injuries, perforating injuries, retro bulbar hemorrhage, and traumatic optic neuropathy.
- Traumatic Injuries To Frontal Sinus: diagnosis, classification, treatment
- Maxillofacial Injuries in Geriatric and Pediatric Patients.
- Gun Shot Wounds and War Injuries
- Osseointegration in Maxillofacial Reconstruction
- Metabolic Response to Trauma: neuro endocrine responses, inflammatory mediators, clinical implications
- Healing of Traumatic Injuries: soft tissues, bone, cartilage, response of peripheral nerve to injury
- Nutritional consideration following Trauma.
- Tracheostomy: indications and contraindications, procedure, complications and their management.

Paper – II :Maxillofacial Surgery

a) Salivary gland

- Sialography
- Salivary fistula and management
- Diseases of salivary gland – developmental disturbances, cysts, inflammation and sialolithiasis
- Mucocele and Ranula
- Tumors of salivary gland and their management
- Staging of salivary gland tumors
- Parotidectomy

b) Temporomandibular Joint

- Etiology, history signs, symptoms, examination and diagnosis of temporomandibular joint disorders
- Ankylosis and management of the same with different treatment modalities
- MPDS and management
- Condylectomy – different procedures
- Various approaches to TMJ
- Recurrent dislocations – Etiology and Management

c) Oncology

- Biopsy
- Management of pre-malignant tumors of head and neck region
- Benign and Malignant tumors of Head and Neck region
- Staging of oral cancer and tumor markers
- Management of oral cancer
- Radical Neck dissection
- Modes of spread of tumors
- Diagnosis and management of tumors of nasal, paranasal, neck, tongue, cheek, maxilla and mandible
- Radiation therapy in maxillofacial regions
- Lateral neck swellings

d) Orthognathic surgery

- Diagnosis and treatment planning
- Cephalometric analysis
- Model surgery
- Maxillary and mandibular repositioning procedures
- Segmental osteotomies
- Management of apertognathia
- Genioplasty
- Distraction osteogenesis

e) Cysts and tumors of oro facial region

- Odontogenic and non-Odontogenic tumors and their management
- Giant Cell lesions of jawbone
- Fibro osseous lesions of jawbone
- Cysts of jaw

f) Laser surgery

- The application of laser technology in surgical treatment of lesions

g) Cryosurgery

- Principles, applications of cryosurgery in surgical management

h) Cleft lip and palate surgery

- Detailed knowledge of the development of the face, head and neck
- Diagnosis and treatment planning
- Current concepts in the management of cleft lip and palate deformity
- Knowledge of Naso endoscopy and other diagnostic techniques in the evaluation of speech and hearing
- Concept of multidisciplinary team management

i) Aesthetic facial surgery

- Detailed knowledge of the structures of the face and neck including skin and underlying soft tissue
- Diagnosis and treatment planning of deformities and conditions affecting facial skin
- Underlying facial muscles, bone, Eyelids, external ear
- Surgical management of post acne scarring, facelift, blepharoplasty, otoplasty, facial bone recontouring, etc

j) Craniofacial surgery

- Basic knowledge of developmental anomalies of the face, head and neck
- Basic concepts in the diagnosis and planning of various head and neck anomalies including facial clefts, craniosynostosis, syndromes, etc.
- Current concept in the management of Craniofacial anomalies

Paper – III : Essays (descriptive and analyzing type questions)

Scheme of Examination:

A. Theory:	Part-I:	Basic Sciences Paper	-	**100 Marks**
	Part-II:	Paper-I, Paper-II & Paper-III	-	**300 Marks**
				(100 Marks for each Paper)

Written examination shall consist of Basic Sciences Paper (Part-I) of three hours duration and should be conducted at the end of First year of MDS course. Part-II Examination will be conducted at the end of Third year of MDS course. Part-II Examination will consist of Paper-I, Paper-II & Paper-III, each of three hours duration. Paper-I & Paper-II shall consist of two long answer questions carrying 25 marks each and five questions carrying 10 marks each. Paper-III will be on Essays. In Paper-III three Questions will be given and student has to answer any two questions. Each question carries 50 marks. Questions on recent advances may be asked in any or all the papers. Distribution of topics for each paper will be as follows: *

PART-I : Applied Basic Sciences: Applied Anatomy, Physiology, & Biochemistry, Pathology, Microbiology, Pharmacology, Research Methodology and Biostatistics.

PART- II

Paper – I : Minor Oral Surgery and Maxillofacial Trauma
Paper – II : Maxillofacial Surgery
Paper – III : Essays (descriptive and analyzing type questions)

**The topics assigned to the different papers are generally evaluated under those sections. However a strict division of the subject may not be possible and some overlapping of topics is inevitable. Students should be prepared to answer overlapping topics*.

B. Practical / Clinical Examination - 200 Marks

1. Minor Oral Surgery - 100 Marks

Each candidate is required to perform the minor oral surgical procedures under local anaesthesia. The minor surgical cases may include removal of impacted lower third

molar, cyst enucleation, any similar procedure where students can exhibit their professional skills in raising the flap, removing the bone and suturing the wound.

2.Case presentation and discussion: 100 Marks

(a) One long case	-	60 Marks
(b) Two short cases	-	40 Marks (20 marks each)

C. Viva Voce - 100 Marks

i. Viva-Voce examination: *80 Marks*

All examiners will conduct viva-voce conjointly on candidate's comprehension, analytical approach, expression, interpretation of data and communication skills. It includes all components of course contents. It includes presentation and discussion on dissertation also.

ii. Pedagogy: *20 Marks*

A topic be given to each candidate in the beginning of clinical examination. He/she is asked to make a presentation on the topic for 8-10 minutes.

4. CONSERVATIVE DENTISTRY AND ENDODONTICS

OBJECTIVES:

The following objectives are laid out to achieve the goals of the course. These are to be achieved by the time the candidate completes the course. These objectives may be considered under the following subtitles.

Knowledge:

At the end of 36 months of training, the candidates should be able to:

- Describe etiology, pathophysiology, periapical diagnosis and management of common restorative situations, endodontic situations that will include contemporary management of dental caries, management of trauma and pulpal pathosis including periodontal situations.
- Demonstrate understanding of basic sciences as relevant to conservative / restorative dentistry and Endodontics.
- Identify social, economic, environmental and emotional determinants in a given case or community and take them into account for planning and execution at individual and community level.
- Ability to master differential diagnosis and recognize conditions that may require multi disciplinary approach or a clinical situation outside the realm of the specialty, which he or she should be able to recognize and refer to appropriate specialist.
- Update himself by self-study and by attending basic and advanced courses, conferences, seminars, and workshops in the specialty of Conservative Dentistry-Endodontics-Dental Materials and Restorative Dentistry.
- Ability to teach/guide, colleagues and other students.
  Use information technology tools and carry out research both basic and clinical with the aim of his publishing his work and presenting the same at scientific platform.

Skills:

- Take proper chair side history, examine the patient and perform medical and dental diagnostic procedures as well as perform relevant tests and interpret to them to come to a reasonable diagnosis about the dental condition in general and Conservative Dentistry – Endodontics in particular. And undertake complete patient monitoring including preoperative as well as post operative care of the patient.
- Perform all levels of restorative work, surgical and non-surgical Endodontics as well as endodontic-periodontal surgical procedures as part of multidisciplinary approach to clinical condition.
- Provide basic life saving support in emergency situations.
- Manage acute pulpal and pulpo periodontal situations.
- Have a thorough knowledge of infection control measures in the dental clinical environment and laboratories.
- Should have proper knowledge of sterilization procedures

Human Values, Ethical Practice and Communication Abilities

- Adopt ethical principles in all aspects of restorative and contemporary Endodontics including non-surgical and surgical Endodontics.
- Professional honesty and integrity should be the top priority.
- Dental care has to be provided regardless of social status, caste, creed or religion of the patient.
- Develop communication skills in particular to explain various options available for management and to obtain a true informed consent from the patient.
- Apply high moral and ethical standards while carrying on human or animal research.

- He/She shall not carry out any heroic procedures and must know his limitations in performing all aspects of restorative dentistry including Endodontics. Ask for help from colleagues or seniors when required without hesitation.
- Respect patient's rights and privileges including patients right to information.

COURSE CONTENTS:

PART-I:

Applied Basic Sciences:

Applied Anatomy of Head and Neck:

- Development of face, paranasal sinuses and the associated structures and their anomalies, cranial and facial bones, TMJ anatomy and function, arterial and venous drainage of head and neck, muscles of face and neck including muscles of mastication and deglutition, brief consideration of structures and function of brain. Brief consideration of all cranial nerves and autonomic nervous system of head and neck. Salivary glands, Functional anatomy of mastication, deglutition and speech. Detailed anatomy of deciduous and permanent teeth, general consideration in physiology of permanent dentition, form, function, alignment, contact, occlusion.
- Internal anatomy of permanent teeth and its significance.
- Applied histology – histology of skin, oral mucosa, connective tissue, bone, cartilage, blood vessels, lymphatics, nerves, muscles, tongue.

Anatomy and Development of Teeth:

- Enamel – development and composition, physical characteristics, chemical properties, structure.
- Age changes – clinical structure.
- Dentin – development, physical and chemical properties, structure type of dentin, innervations, age and functional changes and clinical considerations.
- Pulp – development, histological structures, innervations, functions, regressive changes, clinical considerations.
- Dentin and pulp complex.
- Cementum – composition, cementogenesis, structure, function, clinical considerations.
- Knowledge of internal anatomy of permanent teeth, anatomy of root apex and its implications in endodontic treatment.
- Periodontal ligament – development, structure, function and clinical considerations.
- Salivary glands – structure, function, clinical considerations.

Applied Physiology:

- Mastication, deglutition, digestion and assimilation, fluid and electrolyte balance.
- Blood composition, volume, function, blood groups, haemostasis, coagulation, blood transfusion, circulation, heart, pulse, blood pressure, shock, respiration-control, anoxia, hypoxia, asphyxia, artificial respiration, and endocrinology – general principles of endocrine activity and disorders relating to pituitary, thyroid, parathyroid, adrenals including pregnancy and lactation.
- Physiology of saliva – composition, function, clinical significance.
- Clinical significance of vitamins, diet and nutrition – balanced diet.
- Physiology of pain, sympathetic and Para sympathetic nervous system, pain pathways, physiology of pulpal pain, Odontogenic and non Odontogenic pain, pain disorders – typical and atypical.
- Biochemistry such as osmotic pressure, electrolytic dissociation, oxidation, reduction etc. Carbohydrates, proteins, lipids and their metabolism, nucleoproteins, nucleic acid and

their metabolism. Enzymes, vitamins and minerals, metabolism of inorganic elements, detoxification in the body, anti metabolites, chemistry of blood lymph and urine.

Pathology:

- Inflammation, repair, degeneration, necrosis and gangrene.
- Circulatory disturbances – ischemia, hyperemia, edema, thrombosis, embolism, infarction, allergy and hypersensitivity reaction.
- Neoplasms – classifications of tumors, characteristics of benign and malignant tumors, spread of tumors.
- Blood dyscrasias.
- Developmental disturbances of oral and Para oral structures, dental caries, regressive changes of teeth, pulp, periapical pathology, pulp reaction to dental caries and dental procedures.
- Bacterial, viral, mycotic infections of the oral cavity.

Microbiology:

- Pathways of pulpal infection, oral flora and micro organisms associated with endodontic diseases, pathogenesis, host defense, bacterial virulence factors, healing, theory of focal infections, microbes relevance to dentistry – strepto, staphylococci, lactobacilli, cornyebacterium, actinomycetes, clostridium, neisseria, vibrio, bacteriods, fusobacteria, spirochetes, mycobacterium, virus and fungi.
- Cross infection, infection control, infection control procedure, sterilization and disinfection.
- Immunology – antigen antibody reaction, allergy, hypersensitivity and anaphylaxis, auto immunity, grafts, viral hepatitis, HIV infections and aids. Identification and isolation of microorganisms from infected root canals. Culture medium and culturing technique (Aerobic and anaerobic interpretation and antibiotic sensitivity test).

Pharmacology:

- Dosage and route of administration of drugs, actions and fate of drug in body, drug addiction, tolerance of hypersensitivity reactions.
- Local anesthesia – agents and chemistry, pharmacological actions, fate and metabolism of anaesthetic, ideal properties, techniques and complications.
- General anesthesia – pre medications, neuro muscular blocking agents, induction agents, inhalation anesthesia, and agents used, assessment of anesthetic problems in medically compromised patients.
- Anaesthetic emergencies
- Antihistamines, corticosteroids, chemotherapeutic and antibiotics, drug resistance, haemostasis, and haemostatic agents, anticoagulants, sympathomimitic drugs, vitamins and minerals (A, B, C, D, E, K IRON), anti sialogogue, immunosupressants, drug interactions, antiseptics, disinfectants, anti viral agents, drugs acting on CNS.

Biostatistics:

- Introduction, Basic concepts, Sampling, Health information systems – collection, compilation, presentation of data. Elementary statistical methods – presentation of statistical data, Statistical averages – measures of central tendency, measures of dispersion, Normal distribution. Tests of significance – parametric and non – parametric tests (Fisher extract test, Sign test, Median test, Mann Whitney test, Kruskal Wallis one way analysis, Friedmann two way analysis, ANOVA, Regression analysis), Correlation and regression,Use of computers.

Research Methodology:

- Essential features of a protocol for research in humans
- Experimental and non-experimental study designs

- Ethical considerations of research

Applied Dental Materials:

- Physical and mechanical properties of dental materials, biocompatibility.
- Impression materials, detailed study of various restorative materials, restorative resin and recent advances in composite resins, bonding- recent developments, tarnish and corrosion, dental amalgam, direct filling gold, casting alloys, inlay wax, die materials, investments, casting procedures, defects, dental cements for restoration and pulp protection (luting, liners, bases) cavity varnishes.
- Dental ceramics-recent advances, finishing and polishing materials.
- Dental burs – design and mechanics of cutting – other modalities of tooth preparation. Methods of testing biocompatibility of materials used.

PART-II:

Paper-I: Conservative Dentistry

1. Examination, diagnosis and treatment plan
2. Occlusion as related to conservative dentistry, contact, contour, its significance. Separation of teeth, matrices, used in conservative dentistry.
3. Dental caries- epidemiology, recent concept of etiological factors, pathophysiology, histopathology, diagnosis, caries activity tests, prevention of dental caries and management – recent methods.
4. Hand and rotary cutting instruments, development of rotary equipment, speed ranges, hazards.
5. Dental burs and other modalities of tooth reparation- recent developments (air abrasions, lasers etc.)
6. Infection control procedures in conservative dentistry, isolation equipments etc.
7. Direct concepts in tooth preparation for amalgam, composite, GIC and restorative techniques, failures and management.
8. Biologic response of pulp to various restorative materials and operative procedures.
9. Direct and indirect composite restorations.
10. Indirect tooth colored restorations- ceramic, inlays and onlays, veneers, crowns, recent advances in fabrication and gingival tissue management.
11. Impression procedures used for indirect restorations.
12. Cast metal restorations, indications, contraindications, tooth preparation for class II inlay, onlay, full crown restorations.
    Restorative techniques, direct and indirect methods of fabrication including materials used for fabrication like inlay wax, investment materials and casting.
13. Direct gold restorations.
14. Recent advances in restorative materials.
15. Esthetics including smile design
16. Management of non-carious lesions.
17. Management of discolored tooth
18. Minimal intervention dentistry.
19. Recent advances in restoration of endodontically treated teeth and grossly mutilated teeth.
20. Hypersensitivity-theories, causes and management.
21. Lasers in Conservative Dentistry.
22. CAD-CAM in restorative dentistry.
23. Digital imaging and its applications in restorative dentistry.
24. Clinical Photography.

Paper-II: Endodontics

1. Rationale of endodontics.

2. Pulp and periapical pathology.
3. Pathobiology of periapex.
4. Diagnostic procedures – Orofacial dental pain emergencies: endodontic diagnosis and management, recent advances used for diagnosis.
5. Case selection and treatment planning.
6. Endodontic microbiology.
7. Infection control procedures used in Endodontics (aseptic techniques such as rubber dam, sterilization of instruments etc.)
8. Endodontic emergencies and management.
9. Access cavity preparation – objectives and principles
10. Endodontic instruments and instrumentation – recent developments, detailed description of hand, rotary, sonic, ultra sonic etc.
11. Working length determination, cleaning and shaping of root canal system and recent developments in techniques of canal preparation.
12. Root canal irrigants and intra canal medicaments.
13. Obturation materials, techniques and recent advances.
14. Traumatic injuries and management – endodontic treatment for young permanent teeth.
15. Endodontic surgeries, recent developments in technique and devices and wound healing.
16. Endoperio interrelationship and management.
17. Lasers in Endodontics.
18. Multidisciplinary approach to endodontic situations.
19. Radiology and CBCT in endodontic practice.
20. Procedural errors in endodontics and their management.
21. Endodontic failures and retreatment.
22. Resorptions and its management.
23. Microscopes and Microsurgery in endodontics.
24. Single visit endodontics, current concepts and controversies.
25. Regenerative Endodontics

Paper-III: Essays (descriptive and analyzing type questions)

TEACHING / LEARNING ACTIVITIES:

The post graduate is expected to complete the following at the end of :

The following is the minimum required to be completed before the candidate can be considered eligible to appear for final MDS exam.

First Year

- **Pre Clinical Work – Conservative and Endodontics**
- **Preclinical work on typhodont teeth**

1. Class II amalgam cavities
   a. Conservative preparation - 03
   b. Conventional preparation - 03

2. Inlay cavity preparation including wax pattern and casting on premolars and molars – MO, DO, MOD - 02
3. Onlay preparation on molars including wax pattern and casting - 02

4. Full Crown

a. Anterior - 02
b. Posterior - 02
(1 each to be processed)

- **Pre Clinical work on natural teeth**

1. Wax Carving of all permanent teeth
2. Inlay on molars and premolars MO, DO, and MOD including wax pattern and casting - 05

3. Amalgam cavity preparation
   a. Conventional - 02
   b. Conservative - 02
4. Complex amalgam on molar teeth - 02
5. Onlay on molars including wax pattern and casting - 02
   (1 to be processed)
6. Full crown premolars and molars (metal, PFM & Ceramic) - 04
7. Full crown anterior (PFM, composite& Ceramic) - 03
8. Veneers anterior teeth - 02
9. Composite
   a. Composite Filling (Class I,II,III & V) -05 (each)
   b. Inlay (Class I & II) -02
   c. Veneer -02
   d. Diastema Closure -02
   e. Angle Buildups -02

Endodontics:

1. Sectioning of all maxillary and mandibular teeth (vertical & horizontal).
2. Access cavity opening in relation to maxillary and mandibular permanent teeth.
3. Access cavity preparation, BMP and Obturation
   a) Anterior (3 maxillary and 3 mandibular) - 06
      - Conventional prep - 02
      - Step back - 02
      - Crown down - 02
      - Obturation - 03
      (2 lateral compaction and 1 thermoplasticized)
   b) Premolar - 04
      (2 upper and 2 lower) obturation 1 each
   c) Molar - 06
      (3 upper – 2 first molars and 1 second molar
      3 lower – 2 first molars and 1 second molar) obturation 1 each
4. Post and core preparation and fabrication in relation to anterior and posterior teeth
   a. Anterior 10 (Cast Post 5 and prefabricated post 5)

   b. Posterior 05 (Cast Post 2 and prefabricated post 5)

5. Removable dies - 04

Note : Technique work to be completed in the first four months

Clinical Work:

A	Composite restorations	30
B	GIC Restorations	30

C	Complex amalgam restorations	05
D	Composite inlay + veneers (direct and indirect)	10
E	Ceramic jacket crowns	05
F	Post and core for anterior teeth	10
G	Bleaching vital	05
	Non vital	05
H	RCT Anterior	20
I	Endo surgery – observation and assisting	05

Presentation of:

- Seminars – 5 seminars by each student – should include topics in dental materials, conservative dentistry and endodontics
- Journal clubs – 5 by each student
- Submission of synopsis at the end of 6 months
- Library assignment work
- Internal assessment – theory and clinicals.

Second Year
Case discussion- 5

1	Ceramic jacket crowns	10
2	Post and core for anterior teeth	10
3	Post and core for posterior teeth	05
4	Composite restoration	15
5	Full crown for posterior teeth	15
6	Cast gold inlay	05
7	Other special types of work such as splinting - Reattachment of fractured teeth etc.	10
8	Anterior RCT	30
9	Posterior RCT	40
10	Endo surgery performed independently	05
11	Management of endo – Perio problems	05
12	Angle build up composite	05
13	Diastema closure	05
14	Composite Veneers	05

- Under graduate teaching program as allotted by the HOD
- Seminars – 5 by each student
- Journal club – 5 by each student
- Dissertation work
- Prepare scientific paper / poster and present in conference and clinical meeting
- Library assignment to be submitted 18 months after starting of the course
- Internal assessment – theory and clinical

Third Year

Dissertation work to be submitted 6 months before final examination.

Clinical work

- Cast gold inlay- Onlay, cuspal restoration 10
- Post and core 20
- Molar endodontics 50
- Endo surgery 05
- Diastema Closure 05

- Angle Build up 05
- All other types of surgeries including crown lengthening, perioesthetics, hemi sectioning, splinting, replantation.

Presentation of:

- Seminars – 5 by each student
- Journal club – 5 by each student
- Under graduate teaching program as allotted by the HOD
- Internal assessment – theory and clinical

Monitoring Learning Progress:

It is essential to monitor the learning progress of each candidate through continuous appraisal and regular assessment. It not only helps teachers to evaluate students, but also students to evaluate themselves. The monitoring be done by the staff of the department based on participation of students in various teaching / learning activities. It may be structured and assessment be done using checklists that assess various aspects. Checklists are given in Section IV.

Scheme of Examination:

A. Theory: Part-I: Basic Sciences Paper - **100 Marks**
Part-II: Paper-I, Paper-II & Paper-III - **300 Marks**
(100 Marks for each Paper)

Written examination shall consist of Basic Sciences Paper (Part-I) of three hours duration and should be conducted at the end of First year of MDS course. Part-II Examination will be conducted at the end of Third year of MDS course. Part-II Examination will consist of Paper-I, Paper-II & Paper-III, each of three hours duration. Paper-I & Paper-II shall consist of two long answer questions carrying 25 marks each and five questions carrying 10 marks each. Paper-III will be on Essays. In Paper-III three Questions will be given and student has to answer any two questions. Each question carries 50 marks. Questions on recent advances may be asked in any or all the papers. Distribution of topics for each paper will be as follows: *

PART-I : Applied Basic Sciences: Applied Anatomy, Physiology, Pathology including Oral Microbiology, Pharmacology, Biostatistics and Research Methodology and Applied Dental Materials.

PART-II

Paper-I : Conservative Dentistry
Paper-II : Endodontics
Paper-III : Essays (descriptive and analyzing type questions)

**The topics assigned to the different papers are generally evaluated under those sections. However a strict division of the subject may not be possible and some overlapping of topics is inevitable. Students should be prepared to answer overlapping topics*.

B. Practical / Clinical Examination : 200 Marks

The duration of Clinical and Viva Voce examination will be 2 days for a batch of four students. If the number of candidates exceeds 4, the programme can be extended to 3rd day.

Day 1

Clinical Exercise I – Random case discussion – (2) - 10+10 Marks

(Diagnosis, Treatment, Planning & Discussion)

Cast core preparation

(i) Tooth Preparation	-	20 marks
(ii) Direct Wax Pattern	-	10 marks
(iii) Casting	-	10 marks
(iv) Cementation	-	05 marks
(v) Retraction & Elastomeric Impression	-	05 marks

Clinical Exercise II (Inlay Exercise)	**-**	**30 Marks**
(i) Tooth preparation for Class II Inlay (Gold or Esthetic)	-	20 marks
(ii) Fabrication of Indirect Pattern	-	10 marks

Day 2

Clinical Exercise III (Molar Endodontics)	**-**	**100 Marks**
(i) Local Anaesthesia and Rubber Dam application	-	20 marks
(ii) Access Cavity	-	20 marks
(iii) Working length determination	-	20 marks
(iv) Canal Preparation	-	20 marks
(v) Master cone selection	-	20 marks

C. Viva Voce : 100 Marks

i. Viva-Voce examination : 80 marks

All examiners will conduct viva-voce conjointly on candidate's comprehension, analytical approach, expression, interpretation of data and communication skills. It includes all components of course contents. It includes presentation and discussion on dissertation also.

ii. Pedagogy Exercise : 20 marks

A topic be given to each candidate in the beginning of clinical examination. He/she is asked to make a presentation on the topic for 8-10 minutes.

5. ORTHODONTICS AND DENTOFACIAL ORTHOPEDICS

OBJECTIVES:

The training programme in Orthodontics is to structure and achieve the following four objectives

Knowledge:

1. The dynamic interaction of biologic processes and mechanical forces acting on the stomatognathic system during orthodontic treatment
2. The etiology, pathophysiology, diagnosis and treatment planning of various common Orthodontic problems
3. Various treatment modalities in Orthodontics – preventive, interceptive and corrective.
4. Basic sciences relevant to the practice of Orthodontics
5. Interaction of social, cultural, economic, genetic and environmental factors and their relevance to management of oro – facial deformities
6. Factors affecting the long-range stability of orthodontic correction and their management
7. Personal hygiene and infection control, prevention of cross infection and safe disposal of hospital waste, keeping in view the high prevalence of Hepatitis and HIV and other highly contagious diseases.

Skills:

1. To obtain proper clinical history, methodical examination of the patient, perform essential diagnostic procedures, and interpret them and arrive at a reasonable diagnosis about the Dento-facial deformities.
2. To be competent to fabricate and manage the most appropriate appliance – intra or extra oral, removable or fixed, mechanical or functional, and active or passive – for the treatment of any orthodontic problem to be treated singly or as a part of multidisciplinary treatment of oro-facial deformities.

Attitude:

1. Develop an attitude to adopt ethical principles in all aspects of Orthodontic practice.
2. Professional honesty and integrity are to be fostered
3. Treatment care is to be delivered irrespective of the social status, cast, creed and religion of the patients.
4. Willingness to share the knowledge and clinical experience with professional colleagues
5. Willingness to adopt, after a critical assessment, new methods and techniques of orthodontic management developed from time to time based on scientific research, which are in the best interest of the patient
6. Respect patients' rights and privileges, including patients right to information and right to seek a second opinion
7. Develop attitude to seek opinion from allied medical and dental specialists as and when required

Communication Skills:

1. Develop adequate communication skills particularly with the patients giving them the various options available to manage a particular Dento-facial problem and to obtain a true informed consent from them for the most appropriate treatment available at that point of time.
2. Develop the ability to communicate with professional colleagues, in Orthodontics or other specialties through various media like correspondence, Internet, e-video, conference, etc. to render the best possible treatment.

COURSE CONTENT:

The program outlined, addresses both the knowledge needed in Orthodontics and allied Medical specialties in its scope.

Spread of the Curriculum:

PART-I:

A. Applied Basic Sciences:

Applied Anatomy:

a. Prenatal growth of head:
   Stages of embryonic development, origin of head, origin of face, origin of teeth.
b. Postnatal growth of head:
   Bones of skull, the oral cavity, development of chin, the hyoid bone, general growth of head, growth of the face.
c. Bone growth:
   Origin of bone, composition of bone, units of bone structure, schedule of Ossification, mechanical properties of bone, roentgen graphic appearance of bone
d. Assessment of growth and development:
   Growth prediction, growth spurts, the concept of normality and growth increments of growth, differential growth, gradient of growth, methods of gathering growth data. Theories of growth and recent advances, factors affecting physical growth.
e. Muscles of mastication:
   Development of muscles, muscle change during growth, muscle function and facial development, muscle function and malocclusion
f. Development of dentition and occlusion:
   Dental development periods, order of tooth eruption, chronology of permanent tooth formation, periods of occlusal development, pattern of occlusion.
g. Assessment of skeletal age.

Physiology:

a. Endocrinology and its disorders:
   Growth hormone, thyroid hormone, parathyroid hormone, ACTH.
b. Calcium and its metabolism:
c. Nutrition-metabolism and their disorders:
   Proteins, carbohydrates, fats, vitamins and minerals
d. Muscle physiology:
e. Craniofacial Biology:
   Adhesion molecules and mechanism of adhesion
f. Bleeding disorders in orthodontics: Hemophilia

Dental Materials:

a. Gypsum products:
   Dental plaster, dental stone and their properties, setting reaction etc.
b. Impression materials:
   Impression materials in general and particularly of alginate impression material.
c. Acrylics:
   Chemistry, composition physical properties

d. Composites:
   Composition types, properties, setting reaction
e. Banding and bonding cements:
f. Wrought metal alloys:
   Deformation, strain hardening, annealing, recovery, recrystallization, grain growth, properties of metal alloys
g. Orthodontic arch wires
h. Elastics:
   Latex and non-latex elastics.
i. Applied physics, Bioengineering and metallurgy:
j. Specification and tests methods used for materials used in Orthodontics:
k. Survey of all contemporary literature and recent advances in above mentioned materials:

Genetics:

a. Cell structure, DNA, RNA, protein synthesis, cell division
b. Chromosomal abnormalities
c. Principles of orofacial genetics
d. Genetics in malocclusion
e. Molecular basis of genetics
f. Studies related to malocclusion
g. Recent advances in genetics related to malocclusion
h. Genetic counseling
i. Bioethics and relationship to Orthodontic management of patients.

Physical Anthropology:

a. Evolutionary development of dentition
b. Evolutionary development of jaws.

Pathology:

a. Inflammation
b. Necrosis

Biostatistics:

a. Statistical principles
   - Data Collection
   - Method of presentation
   - Method of Summarizing
   - Methods of analysis – different tests/errors
b. Sampling and Sampling technique
c. Experimental models, design and interpretation
d. Development of skills for preparing clear concise and cognent scientific abstracts and publication

Applied Research Methodology In Orthodontics:

a. Experimental design
b. Animal experimental protocol
c. Principles in the development, execution and interpretation of methodologies in Orthodontics
d. Critical Scientific appraisal of literature.

Applied Pharmacology

Definitions & terminologies used – Dosage and mode of administration of drugs. Action and fate of drugs in the body, Drug addiction, tolerance and hypersensitive reactions, Drugs acting on the central nervous system, general anesthetics hypnotics, analeptics and tranquilizers. Local anesthetics, Chemotherapeutics and antibiotics. Vitamins: A, D, B – complex group, C & K etc.

PART-II:

Paper-I:Basic Orthodontics

OrthodonticHistory:

a. Historical perspective,
b. Evolution of orthodontic appliances,
c. Pencil sketch history of Orthodontic peers
d. History of Orthodontics in India

Concepts of Occlusion and Esthetics:

a. Structure and function of all anatomic components of occlusion,
b. Mechanics of articulation,
c. Recording of masticatory function,
d. Diagnosis of Occlusal dysfunction,
e. Relationship of TMJ anatomy and pathology and related neuromuscular physiology.

Etiology and Classification of Malocclusion:

a. A comprehensive review of the local and systemic factors in the causation of malocclusion
b. Various classifications of malocclusion

Dentofacial Anomalies:

a. Anatomical, physiological and pathological characteristics of major groups of developmental defects of the orofacial structures.

Diagnostic Procedures and Treatment Planning in Orthodontics:

a. Emphasis on the process of data gathering, synthesis and translating it into a treatment plan
b. Problem cases – analysis of cases and its management
c. Adult cases, handicapped and mentally retarded cases and their special problems
d. Critique of treated cases.

Cephalometrics

a. Instrumentation
b. Image processing
c. Tracing and analysis of errors and applications
d. Radiation hazards
e. Advanced Cephalometrics techniques including digital cephalometrics
f. Comprehensive review of literature
g. Video imaging principles and application.

Practice Management in Orthodontics:

a. Economics and dynamics of solo and group practices
b. Personal management
c. Materials management
d. Public relations

e. Professional relationship
f. Dental ethics and jurisprudence
g. Office sterilization procedures
h. Community based Orthodontics.

Paper-II:Clinical Orthodontics

Myofunctional Orthodontics:

a. Basic principles
b. Contemporary appliances –design, manipulation and management
c. Case selection and evaluation of the treatment results
d. Review of the current literature.

Dentofacial Orthopedics:

a. Principles
b. Biomechanics
c. Appliance design and manipulation
d. Review of contemporary literature

Cleft lip and palate rehabilitation:

a. Diagnosis and treatment planning
b. Mechanotherapy
c. Special growth problems of cleft cases
d. Speech physiology, pathology and elements of therapy as applied to orthodontics
e. Team rehabilitative procedures.

Biology of tooth movement:

a. Principles of tooth movement-review
b. Review of contemporary literature
c. Applied histophysiology of bone, periodontal ligament
d. Molecular and ultra cellular consideration in tooth movement

Orthodontic / Orthognathic surgery:

a. Orthodontist's role in conjoint diagnosis and treatment planning
b. Pre and post-surgical Orthodontics
c. Participation in actual clinical cases, progress evaluation and post retention study
d. Review of current literature

Ortho / Perio / Prostho/Endo inter relationship:

a. Principles of interdisciplinary patient treatment
b. Common problems and their management

Basic principles of mechanotherapy includes removable appliances and fixed appliances:

a. Design
b. Construction
c. Fabrication
d. Management
e. Review of current literature on treatment methods and results

Applied preventive aspects in Orthodontics:

a. Caries and periodontal disease prevention
b. Oral hygiene measures

c. Clinical procedures

Interceptive Orthodontics:

a. Principles
b. Growth guidance
c. Diagnosis and treatment planning
d. Therapy emphasis on:
   - Dento-facial problems
   - Tooth material discrepancies
   - Minor surgery for Orthodontics

Evidence Based Orthodontics:

Different types of fixed Mechanotherapy:

Orthodontic Management of TMJ problems, sleep-apnoea etc.:

Retention and relapse:

a. Mechanotherapy – special reference to stability of results with various procedures
b. Post retention analysis
c. Review of contemporary literature

Recent Advances :

a. Use of implants
b. Lasers
c. Application of F.E.M.
d. Distraction Osteogenesis
e. Invisible Orthodontics
f. 3D imaging Digital Orthodontics, Virtual Treatment Planning
g. CAD-CAM bracket Customization
h. Robotic Wire Bending
i. Accelerated Orthodontics
   - Surgical
   - Device assisted or mechanical stimulation
   - Biochemical Mediators
j. Lingual Orthodontics

Paper-III: Essays (descriptive and analyzing type questions)

PRE – CLINICAL EXERCISES
(Should be completed within 3 months)

A general outline of the type of exercises is given here:

1. General Wire bending exercises to develop the manual dexterity.
2. Clasps, Bows and springs used in the removable appliances.
3. Soldering and welding exercises.
4. Fabrication of removable, habit breaking, mechanical and functional appliances, also all types of space maintainers and space regainers.
5. Bonwill Hawley Ideal arch preparation.
6. Construction of orthodontic models trimmed and polished.
7. Cephalometric tracing and various Analyses, also superimposition methods –
8. Fixed appliance typodont exercises.

a) Training shall be imparted in one basic technique i.e. Standard Edgewise / Begg technique or its derivative / Straight wire etc., with adequate exposure to other techniques.
b) Typodont exercise
   - Band making
   - Bracket positioning and placement
   - Different stages in treatment appropriate to technique taught

9. Clinical photography
10. Computerized imaging
11. Preparation of surgical splints, and splints for TMJ problems.
12. Handling of equipment like vacuum forming appliances and hydro solder etc.

Basic Pre-Clinical Exercise Work for the MDS Students:

1. Clasps:

Sl.No	Exercise	No.
1	¾ Clasps	1
2.	Triangular Clasps	1
3.	Adam's clasp	2
4.	Modification of Adam's – With Helix	2
5.	Southend Clasp	1

2. Labial Bows:

Sl.No.	Exercise	No.
1	Short labial bow (upper & lower)	1
2	Long labial bow (upper & lower)	1
3.	Split high labial bow	1

3. Springs:

Sl.No.	Exercise	No.
1	Double cantilever spring	1
2	Coffin spring	1
3	T spring	1

4. Appliances:

Sl.No.	Exercise	No.
1.	Hawley's retention appliance with anterior bite plane	1
2.	Upper Hawley's appliance with posterior bite plane	1
3.	Upper expansion appliance with expansion screw	1
4.	Habit breaking appliance with tongue crib	1
5.	Oral screen and double oral screen	1
6.	Lip bumper	1
7.	Splint for Bruxism	1
8.	Catalans appliance	1
9.	Activator	1
10.	Bionator	1
11.	Frankel-FR 1& 2 appliance	2
12.	Twin block	1
13.	Lingual arch	1
14.	TPA	1

15.	Quad helix	1
16.	Utility arches	1
17.	Pendulum appliance	1
18.	Canine Retractor**(Marcotte & PG Spring)**	1

5. Soldering exercises:

Sl.No.	Exercise	No.
1	Star/Comb/Christmas tree	1

6. Study model preparation:

7. Model analysis – Mixed and permanent Dentition:

8. Cephalometrics:

Sl.No.	Exercise
1	Lateral cephalogram to be traced in different colors and super imposed to see the accuracy of tracing
2	Vertical and Anterio-Posterior Cephalometric analysis
3	Soft tissue analysis – Holdaway and Burstone
4	Various superimposition methods

9. Basics of Clinical Photography including Digital Photography:

10. Typodont exercises: Begg or P.E.A. method/Basic Edgewise:

Sl.No	Exercise
1	Teeth setting in Class-II division I malocclusion with maxillary anterior Proclination and mandibular anterior crowding
2	Band pinching, welding brackets and buccal tubes to the bands
3	Different Stages dependent on the applied technique

CLINICAL WORK:

Once the basic pre-clinical work is completed in three months, the students can take up clinical cases and the clinical training.

Each postgraduate student should start with a minimum of 50 fixed orthodontics cases and 20 removable including myofunctional cases of his/her own. Additionally he/she should handle a minimum of 25 transferred cases.

The type of cases can be as follows:

- Removable active appliances
- Class-I malocclusion with Crowding
- Class-I malocclusion with bi-maxillary protrusion
- Class-II division – 1
- Class-II division – 2
- Class-III (Orthopedic, Surgical, Orthodontic cases)
- Inter disciplinary cases
- Removable functional appliance cases like activator, Bionator, functional regulator, twin block and new developments
- Fixed functional appliances – Herbst appliance, jasper jumper etc
- Dento-facial orthopedic appliances like head gears, rapid maxillary expansion, NiTi expander etc.,
- Appliance for arch development such as molar distalization

- Fixed mechano therapy cases (Begg, PEA, Tip edge, Edgewise, lingual)
- Retention procedures of above treated cases.

Scheme of examination:

A. Theory: Part-I: Basic Sciences Paper - **100 Marks**
Part-II: Paper-I, Paper-II & Paper-III - **300 Marks**
(100 Marks for each Paper)

Written examination shall consist of Basic Sciences Paper (Part-I) of three hours duration and should be conducted at the end of First year of MDS course. Part-II Examination will be conducted at the end of Third year of MDS course. Part-II Examination will consist of Paper-I, Paper-II & Paper-III, each of three hours duration. Paper-I & Paper-II shall consist of two long answer questions carrying 25 marks each and five questions carrying 10 marks each. Paper-III will be on Essays. In Paper-III three Questions will be given and student has to answer any two questions. Each question carries 50 marks. Questions on recent advances may be asked in any or all the papers. Distribution of topics for each paper will be as follows: *

PART-I: Applied Basic Sciences: Applied anatomy, Physiology, Dental Materials, Genetics, Pathology, Physical Anthropology, Applied Research methodology, Bio-Statistics and Applied Pharmacology.

PART-II

Paper I: Orthodontic history, Concepts of occlusion and esthetics, Child and Adult Psychology, Etiology and classification of maloclusion, Dentofacial Anomalies, Diagnostic procedures and treatment planning in Orthodontics, Practice management in Orthodontics

Paper II : Clinical Orthodontics

Paper III : Essays (descriptive and analyzing type questions)

* *The topics assigned to the different papers are generally evaluated under those sections. However a strict division of the subject may not be possible and some overlapping of topics is inevitable. Students should be prepared to answer overlapping topics*.

B. Practical / Clinical Examination : 200 Marks

Exercise No: 1 **50 Marks**
Functional Case :
Selection of case for functional appliance and recording of construction bite.
Fabrication and delivery of the appliance the next day.

Exercise No: 2 : **50 Marks**
1. III stage with auxiliary springs/Wire bending of any stage of fixed orthodontics
(OR)
2. Bonding of SWA brackets and construction of suitable arch wire.

Exercise No. 3 **75 Marks**
Display of records of the treated cases
(Minimum of 5 cases)

Exercise No: 4 **25 Marks**
Long case discussions

Time allotted for each exercise:

No	Exercise	Marks allotted	Approximate Time
1	Functional appliance	50	1 hour (each day)
2	III stage mechanics / Bonding and arch wire fabrication	50	1 hr 30 min
3	Display of case records (a minimum of 5 cases to be presented along with all the patients and records)	75	1 hour
4	Long cases	25	2 hours

Note: The complete records of all the cases should be displayed (including transferred cases)

C. Viva Voce : 100 Marks

i. Viva-Voce examination: *80 marks*

All examiners will conduct viva-voce conjointly on candidate's comprehension, analytical approach, expression, interpretation of data and communication skills. It includes all components of course contents. It includes presentation and discussion on dissertation also.

ii. Pedagogy Exercise: *20 marks*

A topic be given to each candidate in the beginning of clinical examination. He/she is asked to make a presentation on the topic for 8-10 minutes.

6. ORAL & MAXILLOFACIAL PATHOLOGY AND ORAL MICROBIOLOGY

Objectives:

- To train a post graduate dental surgeon so as to ensure higher competence in both general and special pathology dealing with the nature of oral diseases, their causes, processes and effects.
- An oral pathologist is expected to perform routine histopathological evaluation of specimens relating to oral and perioral tissues, to carry out routine diagnostic procedures including hematological, cytological, microbiological, Immunological and ultra structural investigations.
- He/she is expected to have an understanding of current research methodology, collection and interpretation of data, ability to carry out research projects on clinical and or epidemiological aspects, a working knowledge on current databases, automated data retrieval systems, referencing and skill in writing scientific papers.
- He/she is expected to present scientific data pertaining to the field, in conferences both as poster and verbal presentations and totake part in group discussions.

Teaching / Learning Activities:

Broad Outline of Theoretical, Clinical and Practical Courses

I MDS:

1. ***Biostatistics and Research Methodology*:**

   - Basic principles of biostatistics and study as applied to dentistry and research
   - Collection/ organization of data/ measurement scales / presentation of data and analysis
   - Measures of central tendency
   - Measures of variability
   - Sampling and planning of health survey
   - Probability, normal distribution & indicative statistics
   - Estimating population values
   - Tests of significance(parametric/non-parametric qualitative methods)
   - Analysis of variance
   - Association, correlation and regression

   Approach:

   - Didactic Lectures

2. **Applied Gross Anatomy of head and neck, histology and genetics :**

   - Temporo-mandibular joint
   - Trigeminal nerve and facial nerve
   - Muscles of mastication
   - Tongue
   - Salivary glands
   - Nerve supply, blood supply, lymphatic drainage & venous drainage of oro-dental tissues
   - Development of face, palate, mandible, maxilla, tongue and applied aspects of the same
   - Development of teeth & dental tissues and developmental defects of oral and maxilla-facial region & abnormalities of teeth
   - Maxillary sinus
   - Jaw muscles and facial muscles

- Introduction to genetics
- Modes of inheritance
- Chromosomal anomalies of oral tissues & single gene disorders

Approach:

- Didactic Lectures
- Postings in the Department of Anatomy for dissection of Head, Face and Neck

3. Physiology (General & Oral) **:**

- Saliva
- Pain
- Mastication
- Taste
- Deglutition
- Wound healing
- Vitamins (influence on growth, development and structure of oral soft and hard tissues & paraoral tissues)
- Calcium metabolism
- Theories of mineralization
- Tooth eruption and shedding
- Blood and its constituents
- Hormones (influence on growth, development and structure of oral soft and hard tissues & paraoral tissues)

Approach:

- Didactic Lectures

4. Cell Biology **:**

- Cell structure and function (ultra structural & molecular aspects)
- Intercellular junctions
- Cell cycle and division
- Cell cycle regulators
- Cell–cell & cell-extracellular matrix interactions
- Detailed molecular aspects of DNA,RNA and intracellular organelles, transcription and translation and molecular biology techniques

Approach:

- Seminars & Didactic Lectures

5. General Histology **:**

- Light & electron microscopy considerations of epithelial tissues and glands,bone.
- Light & electron microscopy considerations of hemopoetic system, lymphatic system, muscle, neural tissue, endocrinal system (thyroid, pituitary, parathyroid)

Approach:

- Didactic Lectures
- Postings in the Department of Anatomy & Histology for slide discussion
- Record book to be maintained

6. Biochemistry :

- Chemistry of carbohydrates, lipids and proteins

- Methods of identification and purification
- Metabolism of carbohydrates, lipids and proteins
- Biological oxidation
- Various techniques-cell fractionation and ultra filtration, centrifugation, electrophoresis, spectrophotometry and radioactive techniques

Approach:

- Didactic Lectures
- Postings in the Department of Biochemistry to familiarize with various techniques
- Record book to be maintained

7. General Pathology :

- Inflammation and chemical mediator
- Thrombosis
- Embolism
- Necrosis
- Repair
- Degeneration
- Shock
- Hemorrhage
- Pathogenic mechanisms at molecular level
- Blood dyscrasias
- Carcinogenesis and neoplasia

Approach:

- Didactic Lectures & Seminars

***8. General Microbiology** :*

- Definitions of various types of infections
- Routes of infection and spread
- Sterilization ,disinfection and antiseptics
- Bacterial genetics
- Physiology, growth of microorganisms

Approach:

- Didactic Lectures & Seminars

9. Basic Immunology :

- Basic principles of immunity, antigen and antibody reaction
- Cell mediated and humoral immunity
- Immunology of hypersensitivity
- Immunological basis of auto immune phenomena
- Immunodeficiency with relevance to opportunistic infections
- Basic principles of transplantation and tumor immunity

Approach:

- Didactic Lectures & Seminars

10. Systemic Microbiology / Applied Microbiology :

Morphology, classification, pathogenicity, mode of transmission, methods of prevention, collection and transport of specimen for laboratory diagnosis, staining methods, common culture media, interpretation of laboratory reports and antibiotic sensitivity tests.

- Staphylococci
- Streptococci
- Corynebacterium diphtheria
- Mycobacteria
- Clostridia, bacteroids & fusobacteria
- Actinomycetales
- Spirochetes
- General structure, broad classification of viruses, pathogenesis, pathology of viral infections
- Herpes virus
- Hepatitis virus
- HIV
- General properties of fungi
- Superficial, subcutaneous, deep opportunistic infections
- General principles of fungal infections, method of collection of samples, diagnosis and examination of fungi

Approach:

- Didactic Lectures & Seminars
- Postings in the Department of Microbiology to familiarize with relevant diagnostic methods
- Record book to be maintained

11. Oral biology (Oral and Dental Histology) :

- Study of morphology of permanent and deciduous teeth
- Structure and function of oral, dental and paraoral tissues including their ultra structure, molecular and biochemical aspects

Approach:

- Didactic Lectures & Seminars
- Slide discussion on histological appearance of normal oral tissues
- Record book to be maintained

12. Basic Histo-Techniques and Microscopy :

- Routine hematological tests and clinical significance of the same
- Biopsy procedures for oral lesions
- Tissue processing
- Microtome and principles of microtomy
- Various stains used in histopathology and their applications
- Microscope, principles and theories of microscopy
- Light microscopy and various other types including electron microscopy
- Fixation and fixatives
- Ground sections and decalcified sections
- Cytological smears

Approach:

- Didactic Lectures & Seminars
- Postings in Clinical Pathology and Microbiology for relevant training
- Preparation of Ground and decalcified sections, tissue processing, sectioning and staining
- Tooth Carving (Permanent Dentition)
- Record book to be maintained

II MDS:

1. Oral and Dental Pathology:

- Developmental disorders of oral and paraoral structures
- Potentially malignant disorders
- Benign and malignant tumors of the oral cavity
- Odontogenic cysts and tumors
- Pathology of salivary glands
- Regressive alterations of teeth
- Bacterial, fungal, viral and protozoal infections of the oral cavity
- Dental caries
- Diseases of pulp and periapical region
- Spread of oral infection
- Healing of oral wounds
- Physical and chemical injuries of oral cavity
- Oral aspects of metabolic diseases
- Diseases of bones and joints
- Diseases of skin and mucous membrane
- Diseases of periodontia
- Diseases of blood and blood forming organs
- Diseases of nerves and muscles
- Oro-facial pain
- Immunological diseases of oral cavity including tumor immunology
- Molecular pathology
- Oral Microbiology

Approach:

- Didactic Lectures & Seminars
- Postings in the Department of Dermatology of a Medical College
- Postings in a Cancer Centre

2. Basic histo-techniques and microscopy:

- Enzyme histochemistry
- Principles, techniques and applications of immunofluorescence
- Principles, techniques and applications of immunohistochemistry
- Preparation of frozen sections
- Museum set up
- Quality control
- Animal models

Approach:

- Didactic Lectures & Seminars
- Training to be imparted in the Department or in other institutions having the facility
- Visit to the centre of animal experimentation to be familiarize with laboratory techniques, upkeep and care of animals
- Record book to be maintained

3. Recent Molecular Techniques:

- Basic principles, techniques and applications of –
  - PCR
  - BLOTS
  - Hybridization
  - Recombinant DNA technology
  - Micro array
  - DNA sequencing
  - Cell culture and cloning

Approach:

- Didactic Lectures & Seminars
- Training to be imparted in the Department or in other institutions having the facility
- Record book to be maintained

4. Recording of Case History and Clinico-Pathological Discussions:

Approach:

- Postings in the Department of Oral Medicine, Diagnosis & Radiology
- Record of minimum 10 case histories to be maintained

5. Histopathology – Slide discussion:

- Record book to be maintained

III MDS:

- Forensic odontology
- Giant cell lesions
- Clear cell lesions
- Round cell lesions
- Spindle cell lesions
- Pigmented lesions
- Fibro-osseous lesions
- Mechanism of formation and expansion of cysts of orofacial region
- Mechanism of growth and metastasis of tumors
- Lab diagnosis of bacterial infections
- Lab diagnosis of viral infections
- Lab diagnosis of fungal infections
- Hamartomas
- Phakomatoses
- Vascular tumors of oro-facial region
- Genodermatoses
- Tumor markers
- Histogenesis of salivary gland tumors
- Tumor angiogenesis
- Concept of premalignancy
- Blue cell lesions
- Molecular basics of oral squamous cell carcinoma
- Matrix remodelling in pathological condition
- Etiopathogenesis of developmental defects of teeth
- Viral oncogenesis
- Lesions associated with impacted and missing teeth
- Syndromes affecting oro-facial region
- Hereditary oral defects

- Techniques to assess the prognosis of neoplastic lesions
- Vesiculo-bullous lesions
- Lymphoreticular malignancy
- Haemopoietic malignancy
- Micronutrients
- Oral aspects of metabolic disorders
- Hormones and oro-maxillofacial lesions
- Matrix metalloproteinases
- Current concepts in HIV related oral diseases
- Current concepts in OSMF
- Epithelial –connective tissue interaction
- Stem cell research

Approach:

- Didactic Lectures & Seminars
- Postings in the Department of Forensic Medicine / Sciences
- Record book to be maintained

Monitoring Learning Progress:

It is essential to monitor the learning progress of each candidate through continuous appraisal and regular assessment. It not only helps teachers to evaluate students, but also students to evaluate themselves. The monitoring should be done by the staff of the department based on participation of students in various teaching / learning activities. It may be structured and assessment is done using checklists that assess various aspects. Checklists are given in Section IV.

Scheme of Examination:

A. Theory:	Part-I:	Basic Sciences Paper	-	**100 Marks**
	Part-II:	Paper-I, Paper-II & Paper-III	-	**300 Marks**
				(100 Marks for each Paper)

Written examination shall consist of Basic Sciences Paper (Part-I) of three hours duration and should be conducted at the end of First year of MDS course. Part-II Examination will be conducted at the end of Third year of MDS course. Part-II Examination will consist of Paper-I, Paper-II & Paper-III, each of three hours duration.Paper-I & Paper-II shall consist of two long answer questions carrying 25 marks each and five questions carrying 10 marks each. Paper-III will be on Essays. Three Questions will be given and student has to answer any two questions. Each question carries 50 marks. Questions on recent advances may be asked in any or all the papers. Distribution of topics for each paper will be as follows: *

PART-I : Applied Basic Sciences: Applied Anatomy, Physiology (General and oral), Cell Biology, General Histology, Biochemistry, General Pathology, General Pharmacology specially related to drug induced oral mucosal lesions, General and systemic Microbiology, Virology, Mycology, Basic Immunology, Oral Biology (Oral and Dental Histology), Biostatistics and Research Methodology

PART-II

Paper-I : Oral pathology, Oral Microbiology & Immunology and Forensic Odontology
Paper-II : Laboratory techniques & Diagnosis and Oral Oncology
Paper-III : Essays (descriptive and analyzing type questions)

** The topics assigned to the different papers are generally evaluated under those sections. However a strict division of the subject may not be possible and some overlapping of topics is inevitable. Students should be prepared to answer overlapping topics.*

B. Practical/Clinical Examination – 200 Marks

1. **Case Presentation**
   a) Long case – 20 marks
   b) Short case – 10 marks
2. **Clinical Hematology** (any two investigations) – 20 Marks
   Hb%, bleeding time, clotting time, Total WBC count, Differential WBC count and ESR
3. **Smear Presentation** – 20 marks
   Cytology or microbial smear and staining
4. **Paraffin sectioning and H & E Staining** – 30 Marks
5. **Histopathology slide discussion** – 100 Marks

C. Viva Voce – 100 Marks

i. **Viva-Voce examination** – 80 marks
   All examiners will conduct viva-voce conjointly on candidate's comprehension, analytical approach, expression, interpretation of data and communication skills. It includes all components of course contents.

ii. **Pedagogy Exercise** – 20 marks
   A topic be given to each candidate in the beginning of clinical examination. He/she is asked to make a presentation on the topic for 8-10 minutes.

7. PUBLIC HEALTH DENTISTRY

OBJECTIVES:

At the end of 3 years of training the candidate should be able to:

Knowledge:

- Applied basic sciences knowledge regarding etiology, diagnosis and management of the prevention, promotion and treatment of all the oral conditions at the individual and community level.
- Identify social, economic, environmental and emotional determinants in a given individual patient or a community for the purpose of planning and execution of Community Oral Health Program.
- Ability to conduct Oral Health Surveys in order to identify all the oral health problems affecting the community and find solutions using multi – disciplinary approach.
- Ability to act as a consultant in community Oral Health, teach, guide and take part in research (both basic and clinical), present and publish the outcome at various scientific conferences and journals, both national and international level.

Skills:

The candidate should be able to

1. Take history, conduct clinical examination including all diagnostic procedures to arrive at diagnosis at the individual level and conduct survey of the community at state and national level of all conditions related to oral health to arrive at community diagnosis.
2. Plan and perform all necessary treatment, prevention and promotion of Oral Health at the individual and community level.
3. Plan appropriate Community Oral Health Program, conduct the program and evaluate, at the community level.
4. Ability to make use of knowledge of epidemiology to identify causes and plan appropriate preventive and control measures.
5. Develop appropriate person power at various levels and their effective utilization.
6. Conduct survey and use appropriate methods to impart Oral Health Education.
7. Develop ways of helping the community towards easy payment plan, and followed by evaluation for their oral health care needs.
8. Develop the planning, implementation, evaluation and administrative skills to carry out successful community Oral Health Programs.

Values:

1. Adopt ethical principles in all aspects of Community Oral Health Activities.
2. To apply ethical and moral standards while carrying out epidemiological researches.
3. Develop communication skills, in particular to explain the causes and prevention of oral diseases to the patient.
4. Be humble and accept the limitations in his knowledge and skill and to ask for help from colleagues when needed and promote teamwork approach.
5. Respect patient’s rights and privileges including patients right to information and right to seek a second opinion.

COURSE CONTENTS:

A) Applied Basic Sciences:

Applied Anatomy and Histology:

a)Applied Anatomy in relation to:

- Development of face
- Bronchial arches
- Muscles of facial expression
- Muscles of mastication
- TMJ
- Salivary gland
- Tongue
- Hard and soft palate
- Infratemporal fossa
- Paranasal air sinuses
- Pharynx and larynx
- Cranial and spinal nerves- with emphasis on trigeminal, facial, glossopharyngeal and hypoglossal nerve
- Osteology of maxilla and mandible
- Blood supply, venous and lymphatic drainage of head and neck
- Lymph nodes of head and neck
- Structure and relations of alveolar process and edentulous mouth
- Genetics-fundamentals

b)Oral Histology:

- Development of dentition, Innervations of dentin and pulp
- Periodontium-development, histology, blood supply, nerve supply and lymphatic drainage
- Oral mucous membrane
- Pulp-periodontal complex

Applied Physiology and Biochemistry:

- Cell
- Mastication and deglutition
- Food and nutrition
- Metabolism of carbohydrates, proteins and fats
- Vitamins and minerals
- Saliva and Oral health
- Fluid and electrolyte balance
- Pain pathway and mechanism-types, properties
- Blood composition and functions, clotting mechanism and erythropoiesis, Blood groups and transfusions, Pulse and blood pressure,
- Dynamics of blood flow
- Cardiovascular homeostasis-heart sounds
- Respiratory system: Normal physiology and variations in health and diseases, Asphyxia and artificial respiration
- Endocrinology: thyroid, parathyroid, adrenals, pituitary, sex hormones and pregnancy, Endocrine regulation of blood sugar.

Applied Pathology:

- Pathogenic mechanism of molecular level
- Cellular changes following injury
- Inflammation and chemical mediators
- Oedema, thrombosis and embolism
- Hemorrhage and shock
- Neoplasia and metastasis
- Blood disorders
- Histopathology and pathogenesis of dental caries, periodontal disease, oral mucosal lesions, and malignancies
- HIV
- Propagation of dental infection

Microbiology:

- Microbial flora of oral cavity
- Bacteriology of dental caries and periodontal disease
- Methods of sterilization
- Infection control in dental office / camps
- Virology of HIV, herpes, hepatitis
- Parasitology
- Basic immunology – basic concepts of immune system in human body
  - Cellular and humoral immunity
  - Antigen and antibody system
  - Hypersensitivity
  - Autoimmune diseases

Oral Pathology:

- Detailed description of diseases affecting the oral mucosa, teeth, supporting tissues and jaws.

Physical and Social Anthropology:

Anthropology is a part of Social Sciences, which also constitutes behavioral sciences i.e., Psychology and Sociology. Behavioral Sciences has been mentioned in Public Health.

- Introduction and definition
- Appreciation of the biological basis of health and disease
- Evolution of human race, various studies of different races by anthropological methods

Applied Pharmacology:

- Definition, scope and relations to other branches of medicine, mode of action, bioassay, standardization, pharmacodyanamics, pharmcokinetics.
- Chemotherapy of bacterial infections and viral infections – sulphonamides and antibiotics.
- Local anesthesia
- Analgesics and anti-inflammatory drugs
- Hypnotics, tranquilizers and antipyretics
- Important hormones-ACTH, cortisone, insulin and oral antidiabetics.
- Drug addiction and tolerance
- Important pharmacological agents in connection with autonomic nervous system-adrenaline, noradrenaline, atropine
- Brief mention of antihypertensive drugs
- Emergency drugs in dental practice
- Vitamins and haemopoietic drugs

- Effect of drugs on oral health

Research Methodology and Biostatistics:

Health Informatics– basic understanding of computers and its components, operating software (Windows), Microsoft office, preparation of teaching materials like slides, project, multimedia knowledge. Operative skills in analyzing the data.

Research Methodology – definitions, types of research, designing written protocol for research, objectivity in methodology, quantification, records and analysis.

Biostatistics – introduction, applications, uses and limitations of bio – statistics in Public Health dentistry, collection of data, presentation of data, measures of central tendency, measures of dispersion, methods of summarizing, parametric and non parametric tests of significance, correlation and regression, multivariate analysis, sampling and sampling techniques – types, errors, bias, trial and calibration

B) Public Health

Public Health:

- Definition, concepts and philosophy of dental health
- History of public health in India and at international level
- Terminologies used in public health

Health:

- Definition, concepts and philosophy of health
- Health indicators
- Health determinants
- Community and its characteristics and relation to health

Disease:

- Definition, concepts
- Multifactorial causation, natural history, risk factors
- Disease control and eradication, evaluation and causation, infection of specific diseases
- Vaccines and immunization

General Epidemiology:

- Definition and aims, general principles
- Multifactorial causation, natural history, risk factors
- Methods in epidemiology, descriptive, analytical, experimental and classic epidemiology of specific diseases, uses of epidemiology
- Duties of epidemiologist
- General idea of method of investigating chronic diseases, mostly non-infectious nature, epidemic, endemic, and pandemic.
- Ethical conversation in any study requirement
- New knowledge regarding ethical subjects
- Screening of diseases and standard procedures used

Environmental Health:

- Impact of important components of the environment of health
- Principles and methods of identification, evaluation and control of such health hazards
- Pollution of air, water, soil, noise, food
- Water purification, international standards of water
- Domestic and industrial toxins, ionizing radiation

- Occupational hazards
- Waster disposal- various methods and sanitation

Public Health Education:
- Definition, aims, principles of health education
- Health education, methods, models, contents, planning health education programs

Public Health Practice and Administration System in India.

Ethics and Jurisprudence:
- Basic principles of law
- Contract laws- dentist – patient relationships & Legal forms of practice
- Dental malpractice
- Person identification through dentistry
- Legal protection for practicing dentist
- Consumer protection act

Nutrition in Public Health:
- Study of science of nutrition and its application to human problem
- Nutritional surveys and their evaluations
- Influence of nutrition and diet on general health and oral health, dental caries, periodontal disease and oral cancers
- Dietary constituents and cariogenecity
- Guidelines for nutrition

Behavioral Sciences:
- Definition and introduction
- Sociology: social class, social group, family types, communities and social relationships, culture, its effect on oral health.
- Psychology: definition, development of child psychology, anxiety, fear and phobia, intelligence, learning, motivation, personalities, fear, dentist-patient relationship, modeling and experience

Hospital Administration:
- Departmental maintenance, organizational structures
- Types of practices
- Biomedical waste management

Health Care Delivery System:
- International oral health care delivery systems – Review
- Central and state system in general and oral health care delivery system if any
- National and health policy
- National health programmes
- Health Planning and Evaluation
- Primary health care – concepts, oral health in PHC and its implications
- National and international health organizations
- Dentists Act 1928, Dental council of India, Ethics, Indian Dental Association
- Role of W.H.O. and Voluntary organizations in Health Care for the Community

Oral Biology and Genetics:
- A detailed study of cell structure
- Introduction to Genetics, Gene structure, DNA, RNA
- Genetic counseling, gene typing
- Genetic approaches in the study of oral disorders

- Genetic Engineering - Answer to current health problems

Demography & Family Planning:
Demographic trends, family planning methods, milestones in population control in India.

Health Economics:
Health benefit analysis and Cost effective analysis

C) Dental Public Health:

Dental Public Health:
- History
- Definition and concepts of dental public health
- Differences between clinical and community dentistry
- Critical review of current practice
- Dental problems of specific population groups such as chronically ill, handicapped and institutionalized group

Epidemiology of Oral Diseases and Conditions:
- Dental caries, gingival, periodontal disease malocclusion, dental Fluorosis, oral cancer, TMJ disorders and other oral health related problems.

Oral Survey Procedures:
- Planning
- Implementation
- WHO basic oral health methods 1997
- Indices for dental diseases and conditions
- Evaluation

Delivery of Dental Care:
- Dental person power – dental auxiliaries
- Dentist – population ratios,
- Public dental care programs
- School dental health programs- Incremental and comprehensive care
- Private practice and group practice
- Oral health policy – National and international policy

Payment for Dental Care:
- Prepayment
- Post-payment
- Reimbursement plans
- Voluntary agencies
- Health insurance

Evaluation of Quality of Dental Care:
- Problems in public and private oral health care system program
- Evaluation of quality of services, governmental control

Preventive Dentistry:
- Levels of prevention
- Preventive oral health programs screening, health education and motivation
- Prevention of all dental diseases-dental caries, periodontal diseases, oral cancer, malocclusion and Dentofacial anomalies
- Role of dentist in prevention of oral diseases at individual and community level.
- Fluoride

  - History
  - Mechanism of action
  - Metabolism
  - Fluoride toxicity
  - Fluorosis
  - Systemic and topical preparations
  - Advantages and disadvantages of each
  - Update regarding Fluorosis
  - Epidemiological studies
  - Methods of fluoride supplements
  - Defluoridation techniques
  - Antifluoridation lobby
- Plaque control measures-
  - Health Education
  - Personal oral hygiene
  - Tooth brushing technique
  - Dentifrices, mouth rinses
- Pit and fissure sealant, ART, Preventive resin restoration
- Preventive oral health care for medically compromised individual
- Update on recent preventive modalities
- Caries vaccines
- Dietary counseling

Practice Management:

- Definition
- Principles of management of dental practice and types
- Organization and administration of dental practice
- Ethical and legal issues in dental practice
- Current trends
- Infection control in dental practice

Tobacco Counseling:

- Health Consequences
- Tobacco dependence
- Benefits of intervention
- Tobacco cessation
- Role of dentist

Health Man Power Planning:

Structured Training Schedule:

FIRST YEAR

Seminars:

- 5 seminars in basic sciences subject,
- To conduct 10 journal clubs
- Library assignment on assigned topics – 2
- Submission of synopsis for dissertation-within 6 months
- Periodic review of dissertation at two monthly intervals

Clinical Training:

1. Clinical assessment of patient

2. Learning different criteria and instruments used in various oral indices assessing oral hygiene, periodontal disease, wasting disease, flourosis and malocclusion – 5 cases each
   - Oral Hygiene Index – Greene and Vermillion
   - Oral Hygiene Index – Simplified
   - DMF – DMF (T), DMF (S)
   - def t/s
   - Fluorosis Indices – Dean's Fluorosis Index, Tooth Surface Index for Fluorosis, Thylstrup and Fejerskov Index
   - Community Periodontal Index (CPI)
   - Plaque Index-Silness and Loe, gingival index – Loe and Silness
   - Russels periodontal disease index
   - WHO Oral Health Assessment Form – 1997
   - Carrying out treatment (under comprehensive oral health care) of 10 patients
   - maintaining complete records.

Field Programme:

- Carrying out preventive programs and health education for school children of the adopted school.
- School based preventive programs-
- Topical Fluoride application-Sodium Fluoride, Stannous Fluoride, Acidulated Phosphate Fluoride preparations and Fluoride varnishes, Fluoride mouth rinses
- Pit and Fissure Sealant – chemically cured (GIC), light cured
- Minimal Invasive Treatment-Preventive Resin Restorations (PRR), Atraumatic Restorative Treatment (ART)
- Organizing and carrying out dental camps in both urban and rural areas.

3. Visit to slum, water treatment plant, sewage treatment plant, and Milk dairy, Public Health Institute, Anti-Tobacco Cell, Primary Health Center and submitting reports.
4. In additions the postgraduate shall assist and guide the under graduate students in their clinical and field programs.

SECOND YEAR

Seminars:

- Seminars in Public Health and Dental Public Health topics
- Conducting journal clubs
- Short term research project on assigned topics – 2
- Periodic review of dissertation at monthly reviews

Clinical Training-Continuation of the Clinical Training:

1. Clinical assessment of patient
2. Learning different criteria and instruments used in various oral indices assessing oral hygiene, periodontal disease, wasting disease, flourosis and malocclusion – 5 each
   - Oral Hygiene Index – Greene and Vermillion
   - Oral Hygiene Index – Simplified
   - DMF – DMF (T), DMF (S)
   - def t/s
   - Fluorosis Indices – Dean's Fluorosis Index, Tooth Surface Index for Fluorosis, Thylstrup and Fejerskov Index
   - Community Periodontal Index (CPI)
   - Plaque Index-Silness and Loe, gingival index – Loe and Silness
   - Russels periodontal disease index

- WHO Oral Health Assessment Form – 1987
- Carrying out treatment (under comprehensive oral health care) of 10 patients – maintaining complete records

Field Program – Continuation of Field Program:

- Carrying out school dental health education
- School based preventive programs-
  - Topical Fluoride application-Sodium Fluoride, Stannous Fluoride, Acidulated Phosphate Fluoride preparations and Fluoride varnishes, Fluoride mouth rinses
  - Pit and Fissure Sealant – chemically cured (GIC), light cured
  - Minimal Invasive Treatment-Preventive Resin Restorations (PRR), Atraumatic Restorative Treatment (ART)
  - Organizing and carrying out dental camps in both urban and rural areas.
- Assessing oral health status of various target groups like School children, Expectant mothers Handicapped, Underprivileged, and geriatric populations. Planning dental manpower and financing dental health care for the above group**.**
- Application of the following preventive measures in clinic-10 Cases each.
  - Topical Fluoride application – Sodium Fluoride, Stannous Fluoride, Acidulated Phosphate Fluoride preparations and Fluoride varnishes.
  - Pit and Fissure Sealant
- Planning total health care for school children in an adopted school:
  - Periodic surveying of school children
  - Incremental dental care
  - Comprehensive dental care
- Organizing and conducting community oral health surveys for all oral conditions-3 surveys
- In addition the post graduate shall assist and guide the under graduate students in their clinical and field programs
- To take lecture classes (2) for Undergraduate students in order to learn teaching methods (pedagogy) on assigned topic.

THIRD YEAR:

Seminars:

- Seminars on recent advances in Preventive Dentistry and Dental Public Health
- Critical evaluation of scientific articles – 10 articles
- Completion and submission of dissertation

Clinical Training:

- Clinical assessment of patient
- Learning different criteria and instruments used in various oral indices assessing oral hygiene, periodontal disease, wasting disease, flourosis and malocclusion – 5 each
  - Oral Hygiene Index – Greene and Vermillion
  - Oral Hygiene Index – Simplified
  - DMF – DMF (T), DMF (S)
  - def t/s
  - Fluorosis Indices – Dean's Fluorosis Index, Tooth Surface Index for Fluorosis, Thylstrup and Fejerskov Index
  - Community Periodontal Index (CPI)
  - Plaque Index-Silness and Loe, gingival index – Loe and Silness
  - Russels periodontal disease index

  - WHO Oral Health Assessment Form – 1987
  - Carrying out treatment (under comprehensive oral health care) of 10 patients – maintaining complete records
- Carrying out school dental health education
- School based preventive programs-
  - Topical Fluoride application – Sodium Fluoride, Stannous Fluoride, Acidulated Phosphate Fluoride preparations and Fluoride varnishes.
  - Pit and Fissure Sealant
  - Minimal Invasive Techniques – Preventive Resin Restorations (PRR), Atraumatic Restorative Treatment (ART)
- To take lecture classes (2) for Undergraduate students in order to learn teaching methods (pedagogy) on assigned topic
- Exercise on solving community health problems – 10 problems
- Application of the following preventive measures in clinic – 10 cases each.
  - Topical Fluoride application – Sodium Fluoride, Stannous Fluoride, Acidulated Phosphate Fluoride preparations
  - Pit and Fissure sealants
- Dental – health education training of school teachers, social workers, health workers,
- Posting at dental satellite centers/ nodal centers
- In addition the post graduate shall assist and guide the under graduate students in their clinical and field programs.

Monitoring Learning Process:

It is essential to monitor the learning progress of each candidate through continuous appraisal and regular assessment. It not only helps teachers to evaluate students, but also students to evaluate themselves. The monitoring be done by the staff of the department based on participation of students in various teaching / learning activities. It may be structured and assessment be done using checklists that assess various aspects. Checklists are given in Section IV.

Scheme of Examination

A. Theory:	Part-I: Basic Sciences Paper	-	**100 Marks**
	Part-II: Paper-I, Paper-II & Paper-III	-	**300 Marks**
			(100 Marks for each Paper)

Written examination shall consist of Basic Sciences Paper (Part-I) of three hours duration and should be conducted at the end of First year of MDS course. Part-II Examination will be conducted at the end of Third year of MDS course. Part-II Examination will consist of Paper-I, Paper-II & Paper-III, each of three hours duration. Paper-I & Paper-II shall consist of two long answer questions carrying 25 marks each and five questions carrying 10 marks each. Paper-III will be on Essays. In Paper-III three Questions will be given and student has to answer any two questions. Each question carries 50 marks. Questions on recent advances may be asked in any or all the papers. Distribution of topics for each paper will be as follows: *

PART-I **:** Applied Basic Sciences:Applied Anatomy and Histology, Applied Physiology and Biochemistry, Applied Pathology, Microbiology, Oral Pathology, Physical and Social Anthropology, Applied Pharmacology and Research Methodology and Biostatistics.

PART-II **:**

Paper-I **:** Public Health
Paper-II **:** Dental Public Health

Paper-III : Essays (descriptive and analyzing type questions)

** The topics assigned to the different papers are generally evaluated under those sections. However a strict division of the subject may not be possible and some overlapping of topics is inevitable. Students should be prepared to answer overlapping topics.*

B. Practical / Clinical Examination : 200 Marks

1. Clinical examination of at least 2 patients representing the community – includes history, main complaints, examination and recording of the findings, using indices for the assessment of oral health and presentation of the observation including diagnosis, comprehensive treatment planning. (50 Marks – 1 ½ Hrs)

2. Performing (50 Marks– 1 ½ Hrs)
   a. One of the treatment procedures as per treatment plan. (Restorative, surgical, rehabilitation)
   b. Preventive oral health care procedure.
   c. One of the procedures specified in the curriculum

3. Critical evaluation of a given research article published in an international journal
   - Marks – 1 Hour)

4. Problem solving – a hypothetical oral health situation existing in a community is given with sufficient data. The student as a specialist in community dentistry is expected to suggest practical solutions to the existing oral health situation of the given community. (50 Marks – 1 ½ Hours)

C. Viva Voce : 100 Marks

i. Viva-Voce examination *: 80 marks*

All examiners will conduct viva-voce conjointly on candidate's comprehension, analytical approach, expression, interpretation of data and communication skills. It includes all components of course contents. It includes presentation and discussion on dissertation also.

ii. Pedagogy Exercise *: 20 marks*

A topic be given to each candidate in the beginning of clinical examination. He/she is asked to make a presentation on the topic for 8-10 minutes.

8. PEDIATRIC AND PREVENTIVE DENTISTRY

OBJECTIVES:

At the end of 3 years of training the candidate should be able to

1. Create not only a good oral health in the child but also a good citizen tomorrow.
2. Instill a positive attitude and behavior in children
3. Understand the principles of prevention and preventive dentistry right from birth to adolescence
4. Guide and counsel the parents in regards to various treatment modalities including different facets of preventive dentistry
5. Prevent and intercept developing malocclusion

Skills:

1. Obtain proper clinical history, methodological examination of the child patient, perform essential diagnostic procedures and interpret them. and arrive at a reasonable diagnosis and treat appropriately
2. Be competent to treat dental diseases which are occurring in child patient.
3. Manage to repair and restore the lost / tooth structure to maintain harmony between both hard and soft tissues of the oral cavity.
4. Manage the disabled children effectively and efficiently, tailored to the needs of individual requirement and conditions.
5. To acquire skills in managing efficiently life threatening conditions with emphasis on basic life support measures.

Attitudes:

1. Develop an attitude to adopt ethical principles in all aspects of Pedodontic practice.
2. Professional honesty and integrity are to be fostered
3. Treatment care is to be delivered irrespective of the social status, cast, creed, and religion of the patients.
4. Willingness to share the knowledge and clinical experience with professional colleagues.
5. Willingness to adopt, after a critical assessment, new methods and techniques of Pedodontic management developed from time to time, based on scientific research, which are in the best interest of the child patient.
6. Respect child patient's rights and privileges, including child patients right to information and right to seek a second opinion.
7. Develop an attitude to seek opinion from allied medical and dental specialities, as and when required

COURSE CONTENTS:

A) Applied Basic Sciences:

Applied Anatomy of Head and Neck:

- Anatomy of the scalp, temple and face
- Anatomy of the triangles of neck and deep structures of the neck
- Cranial and facial bones and its surrounding soft tissues with its applied aspects
- Muscles of head and neck
- Arterial supply, venous drainage and lymphatics of head and neck
- Congenital abnormalities of the head and neck
- Anatomy of the cranial nerves

- Anatomy of the tongue and its applied aspects
- Anatomy and its applied aspects of salivary glands, pharynx, thyroid and parathyroid gland, larynx, trachea, esophagus
- Autonomous nervous system of head and neck
- Functional anatomy of mastication, deglutition, speech, respiration and circulation
- TMJ: anatomy and function

Applied Physiology:

Introduction, Mastication, deglutition, digestion and assimilation, Homeostasis, fluid and electrolyte balance. Blood composition, volume, function, blood groups and hemorrhage, Blood transfusion, circulation, Heart, Pulse, Blood pressure, Normal ECG,capillary and lymphatic circulation, shock, respiration, control, anoxia, hypoxia, asphyxia, artificial respiration. Endocrine glands in particular reference to pituitary, parathyroid and thyroid glands and sex hormones. Role of calcium and Vit D in growth and development of teeth, bone and jaws.Role of Vit.A, C and B complex in oral mucosal and periodontal health.Physiology and function of the masticatory system. Speech mechanism, swallowing and deglutition mechanism, salivary glands and Saliva

Applied Pathology:

Inflammation and chemical mediators, Thrombosis, Embolism, Necrosis, Repair, Degeneration , Shock, Hemorrhage , Blood dyscrasias, Pathogenesis of Dental Caries, Periodontal diseases, tumors, oral mucosal lesions etc. in children

Applied Microbiology:

Microbiology & Immunology as related to Oral Diseases in Children: Basic concepts, immune system in human body, Auto Immune diseases and Immunology of Dental caries.

Applied Nutrition & Dietics:

- General principles, balanced diet, effect of dietary deficiencies and starvation, protein energy, malnutrition, Kwashiorkor, Marasmus.
- Fluid and Electrolytic balance in maintaining haemostasis
- Diet, digestion, absorption, transportation and utilization

Genetics:

- Introduction to genetics
- Cell structure, DNA, RNA, protein synthesis, cell division
- Modes of inheritance
- Chromosomal anomalies of oral tissues & single gene disorders

Growth & Development:

Prenatal and Postnatal development of cranium, face, jaws, teeth and supporting structures.Chronology of dental development and development of occlusion. Dimensional changes in dental arches. Cephalometric evaluation of growth.

B) Pediatric Dentistry:

- Child Psychology:

  Development & Classification of behavior, personality, intelligence in children, theories of child psychology, stages of psychological child development, fear, anxiety, apprehension & its management.

- Behavior Management: Non- pharmacological & Pharmacological methods.

- Child Abuse & Dental Neglect:

- Conscious Sedation:

- Deep Sedation & General Anesthesia in Pediatric Dentistry: (Including Other Drugs, Synergic & Antagonistic Actions of Various Drugs Used in Children

Preventive Pedodontics:

Concepts, chair side preventive measures for dental diseases, high-risk caries including rampant & extensive caries – Recognition, Features & Preventive Management, Pit and Fissures Sealants, Oral Hygiene measures, Correlation of brushing with dental caries and periodontal diseases. Diet & Nutrition as related to dental caries. Diet Counseling

Dental Plaque:

Definition, Initiation, Pathogenesis, Biochemistry, and Morphology & Metabolism.

Gingival & Periodontal diseases in Children:

- Normal Gingiva & Periodontium in children.
- Gingival & Periodontal diseases – Etiology, Pathogenesis, Prevention & Management

Pediatric Operative Dentistry:

- Principle of Operative Dentistry along with modifications of materials/past, current & latest including tooth colored materials.
- Modifications required for cavity preparation in primary and young permanent teeth.
- Various Isolation Techniques
- Restorations of decayed primary, young permanent and permanent teeth in children using various restorative material like Glass Ionomer, Composites, Silver, Amalgam & latest material (gallium)
- Stainless steel, Polycarbonate & Resin Crowns / Veneers & fibre post systems.

Pediatric Endodontics:

- Primary Dentition: - Diagnosis of pulpal diseases and their management – Pulp capping, Pulpotomy, Pulpectomy (Materials & Methods), Controversies & recent concepts.
- Young permanent teeth and permanent teeth, Pulp capping, Pulpotomy, Apexogenesis, Apexification, Concepts, Techniques and Materials used for different procedures.
- Recent advances in Pediatric diagnosis and Endodontics.
  Prosthetic consideration in Pediatric Dentistry.

Traumatic Injuries in Children:

- Classifications & Importance.
- Sequelae & reaction of teeth to trauma.
- Management of Traumatized teeth with latest concepts.
- Management of jaw fractures in children.

Interceptive Orthodontics:

- Concepts of occlusion and esthetics: Structure and function of all anatomic components of occlusion, mechanics of articulations, recording of masticatory function, diagnosis of Occlusal dysfunction, relationship of TMJ anatomy and pathology and related neuromuscular physiology.

- A comprehensive review of the local and systemic factors in the causation of malocclusion.
- Recognition and management of normal and abnormal developmental occlusions in primary, mixed and permanent dentitions in children (Occlusal Guidance).
- Biology of tooth movement: A comprehensive review of the principles of teeth movement. Review of contemporary literature. Histopathology of bone and Periodontal ligament, Molecular and ultra cellular consideration in tooth movement.
- Myofunctional appliances: Basic principles, contemporary appliances: Design & Fabrication
- Removable appliances: Basic principles, contemporary appliances: Design & Fabrication
- Case selection & diagnosis in interceptive Orthodontics (Cephalometrics, Image processing, Tracing, Radiation hygiene, Video imaging & advance Cephalometric techniques).
- Space Management: Etiology, Diagnosis of space problems, analysis, Biomechanics, Planned extraction in interceptive orthodontics.

Oral Habits in Children:

- Definition, Etiology & Classification
- Clinical features of digit sucking, tongue thrusting, mouth breathing & various other secondary habits.
- Management of oral habits in children

Dental care of Children with special needs:

Definition, Etiology, Classification, Behavioral, Clinical features & Management of children with:

- Physically handicapped conditions
- Mentally compromising conditions
- Medically compromising conditions
- Genetic disorders

Oral manifestations of Systemic Conditions in Children & their Management
Management of Minor Oral Surgical Procedures in Children
Dental Radiology as related to Pediatric Dentistry

Cariology:

- Historical background
- Definition, Aeitology & Pathogenesis
- Caries pattern in primary, young permanent and permanent teeth in children.
- Rampant caries, early childhood caries and extensive caries. Definition, aeitology, Pathogenesis, Clinical features, Complications & Management.
- Role of diet and nutrition in Dental Caries
- Dietary modifications & Diet counseling.
- Subjective & objective methods of Caries detection with emphasis on Caries Activity tests, Caries prediction, Caries susceptibility & their clinical Applications

Pediatric Oral Medicine & Clinical Pathology: Recognition & Management of developmental dental anomalies, teething disorders, stomatological conditions, mucosal lesions, viral infections etc.

Congenital Abnormalities in Children: Definition, Classification, Clinical features & Management.

Dental Emergencies in Children and their Management.

Dental Materials used in Pediatric Dentistry.

C) Preventive Dentistry:

- Definition
- Principles & Scope
- Types of prevention
- Different preventive measures used in Pediatric Dentistry including fissure sealants and caries vaccine.

Dental Health Education & School Dental Health Programmes:

Dental health concepts, Effects of civilization and environment, Dental Health delivery system, Public Health measures related to children along with principles of Pediatric Preventive Dentistry

Fluorides:

- Historical background
- Systemic & Topical fluorides
- Mechanism of action
- Toxicity & Management.
- Defluoridation techniques.

Medico legal aspects in Pediatric Dentistry with emphasis on informed concert.

Counseling in Pediatric Dentistry

Case History Recording: Outline of principles of examination, diagnosis & treatment planning.

Epidemiology: Concepts, Methods of recording & evaluation of various oral diseases. Various national & global trends of epidemiology of oral diseases.

Comprehensive Infant Oral Health Care.

Principles of Bio-Statistics& Research Methodology & Understanding of Computers and Photography

Comprehensive cleft care management with emphasis on counseling, feeding, nasoalveolar bone remodeling, speech rehabilitation.

Setting up of Pediatric Dentistry Clinic.

Emerging concepts in Pediatric Dentistry of scope of lasers / minimum invasive procedures in Pediatric Dentistry.

Preclinical Work

(Duration – first 6 Months of First Year MDS)

(One on Each Exercise)

1. Carving of all deciduous teeth
2. Basic wire bending exercises(Clasps, Bows, Retractors and Springs, etc., on patient models)
3. Basics for Spot welding exercises
4. Fabrication of
   a. Maxillary bite plate / Hawley's'
   b. Maxillary expansion screw appliance
   c. Canine retractor appliance

d. All habit breaking appliances
   - Removable type
   - Fixed type
   - Partially fixed and removable

e. Myofunctional appliances – Twin block, Activator, Lip bumper, Oral Screen
f. Making of inclined plane appliance
g. Feeding appliances

5. Basic soldering exercises – making of a lamppost of stainless steel wire pieces of different gauges soldered on either side of heavy gauge main post.
6. Fabrication of space maintainers
   a. Removable type-
      - Unilateral Non – Functional space maintainer
      - Bilateral Non-Functional space maintainer
   b. Space Regainers –
      - Gerber or Opencoil space regainer
   c. Fixed Space maintainers
      - Band & loop space maintainer
      - Transpalatal arch space maintainer
      - Nance Palatal holding arch
      - Distal shoe appliance
7. Basics for spot welding exercise
8. Collection of extracted deciduous and permanent teeth
   a. Sectioning of the teeth at various levels and planes
   b. Drawing of section and shapes of pulp
   c. Phantom Head Exercises : Performing ideal cavity preparation for various restorative materials for both Deciduous and permanent teeth
   d. Performing pulpotomy, root canal treatment and Apexification procedure
      i) Tooth preparation and fabrication of various temporary and permanent restorations on fractured anterior teeth.
      ii) Preparation of teeth for various types of crowns
      iii) Laminates/veneers
      iv) Bonding & banding exercise
9. Performing of behavioral rating and IQ tests for children.
10. Computation of: -
    a. Caries index and performing various caries activity tests.
    b. Oral Hygiene Index
    c. c. Fluorosis Index
11. Surgical Exercises :
    a. Fabrication of splints
    b. Type of Wiring
    c. Suturing
12. a. Taking of periapical, occlusal, bitewing radiographs of children
    b. Developing and processing of films, thus obtained
    c. Tracing of soft tissue dental and skeletal landmarks as observed on Cephalometric radiographs and drawing of various planes and angles, further interpretation of Cephalometric radiographs.
    d. Mixed dentition cast analysis
13. Library assignment
14. Synopsis

Clinical work Requirements from 7 to 36 months

The following is the minimum requirement to be completed before the candidate can be considered eligible to appear in the final M.D.S Examinations:

S.	Clinical Work	Total	7 To 12	13 To 24	25 To 36

			Months	Months	Months
1.	Behavior Management of different age groups children with complete records.	17	2	10	5
2.	Detailed Case evaluation with complete records, treatment planning and presentation of cases with chair side and discussion	17	2	10	5
3.	Step-by-step chair side preventive dentistry scheduled for high risk children with gingival and periodontal diseases &Dental Caries	11	1	5	5
4.	Practical application of Preventive dentistry concepts in a class of 35-50 children& Dental Health Education & Motivation.	7	1	4	2
5.	Pediatric Operative Dentistry with application of recent concepts. (a). Management of Dental Caries				
	(I) Class I	50	30	10	10
	(II) Class II	100	40	50	10
	(III) Other Restorations	100	20	50	30
	(b). Management of traumatized anterior teeth	15	04	06	05
	(c) Aesthetic Restorations	25	05	10	10
	(d). Pediatric Endodontic Procedures Deciduous teeth Pulpotomy / Pulpectomy Permanent Molars Permanent Incisor Apexification & Apexogenesis	 150 20 15 20	 30 3 2 02	 50 7 3 08	 70 10 10 10
6.	Stainless Steel Crowns	50	10	20	20
7.	Other Crowns	05	01	02	02
8.	Fixed : Space Maintainers Habit breaking appliances	30	08	12	10
9.	Removable : Space Maintainers Habit breaking appliances	20	05	07	08
10.	Functional Appliances	05	01	02	02
11.	Preventive measures like fluoride applications & Pit & Fissure Sealants applications with complete follow-up and diet counseling	20	08	08	04
12.	Special Assignments (i) School Dental Health Programmes	03	01	01	01
	(ii) Camps etc.,	02	01	01	-
13	Library usage				
14	Laboratory usage				
15	Continuing Dental Health Programmes				

(The figures given against Sl. No. 4 to 12 are the minimum number of recommended procedures to be performed)

Monitoring Learning Progress:

It is essential to monitor the learning progress of each candidate through continuous appraisal and regular assessment. It not only helps teachers to evaluate students, but also students to evaluate themselves. The monitoring is to be done by the staff of the department based on participation of students in various teaching / learning activities. It may be

structured and assessment be done using checklists that assess various aspects. Checklists are given in Section IV

Scheme of Examination:

A. Theory:	Part-I: Basic Sciences Paper	-	**100 Marks**
	Part-II:Paper-I, Paper-II & Paper-III	-	**300 Marks**
			(100 Marks for each Paper)

Written examination shall consist of Basic Sciences Paper (Part-I) of three hours duration and should be conducted at the end of First year of MDS course. Part-II Examination will be conducted at the end of Third year of MDS course. Part-II Examination will consist of Paper-I, Paper-II & Paper-III, each of three hours duration. Paper-I & Paper-II shall consist of two long answer questions carrying 25 marks each and five questions carrying 10 marks each. Paper-III will be on Essays. In Paper-III three Questions will be given and student has to answer any two questions. Each question carries 50 marks. Questions on recent advances may be asked in any or all the papers. Distribution of topics for each paper will be as follows: *

Part-I: Applied Basic Sciences – Applied Basic Sciences:Applied Anatomy, Physiology, & Biochemistry, Pathology, Microbiology, Pharmacology, Research Methodology and Biostatistics Growth & Development and Dental plaque, Genetics.

Part-II:

Paper-I :**Clinical Paedodontics**

1. Conscious sedation, Deep Sedation & General Anesthesia in Pediatric Dentistry
2. Gingival & Periodontal Diseases in Children
3. Pediatric Operative Dentistry
4. Pediatric Endodontics
5. Traumatic Injuries in Children
6. Interceptive Orthodontics
7. Oral Habits in children
8. Dental Care of Children with special needs
9. Oral Manifestations of Systemic Conditions in Children & their Management
10. Management of Minor Oral Surgical Procedures in Children
11. Dental Radiology as Related to Pediatric Dentistry
12. Pediatric Oral Medicine & Clinical Pathology
13. Congenital Abnormalities in Children
14. Dental Emergencies in Children & Their Management
15. Dental Materials Used in Pediatric Dentistry
16. Case History Recording
17. Setting up of Pedodontic & Preventive Dentistry Clinic

Paper-II: Preventive and Community Dentistry as applied to Pediatric Dentistry

1. Child Psychology
2. Behavior Management
3. Child Abuse & Dental Neglect
4. Preventive Pedodontics
5. Cariology
6. Preventive Dentistry
7. Dental Health Education & School Dental Health Programmes:
8. Fluorides
9. Epidemiology
10. Comprehensive Infant Oral Health Care/Comprehensive cleft care
11. Principles of Bio-Statistics & Research Methodology & Understanding of Computers and Photography

Paper-III: Essays (descriptive and analyzing type questions)

** The topics assigned to the different papers are generally evaluated under those sections. However a strict division of the subject may not be possible and some overlapping of topics is inevitable. Students should be prepared to answer overlapping topics.*

B. Practical / Clinical Examination : 200 Marks

The Clinical / Practical and Viva-Voce Examinations are conducted for a minimum of two days.

First Day:

1. Case Discussion, Pulp Therapy i.e. Pulpectomy on a Primary Molar.

Case Discussion	:	20 marks
Rubber Dam application	:	10 marks
Working length X-ray	:	20 marks
Obturation	:	20 marks
Total		70 marks

2. Case Discussion, Crown preparation on a Primary Molar for Stainless steel crown and cementation of the same.

Case discussion	:	10 marks
Crown Preparation	:	20 marks
Crown selection and Cementation	:	20 marks
Total		50 marks

3. Case Discussion, band adaptation for fixed type of space maintainer and impression making.

Case discussion	:	20 marks
Band adaptation	:	20 marks
Impression	:	20 marks
Total		60 marks

Second Day:

1. **Evaluation of Fixed Space Maintainer and Cementation** : 20 marks

C. Viva Voce : 100 Marks

i. Viva-Voce examination *: 80 marks*

All examiners will conduct viva-voce conjointly on candidate's comprehension, analytical approach, expression, interpretation of data and communication skills. It includes all components of course contents. It includes presentation and discussion on dissertation also.

ii. Pedagogy Exercise *: 20 marks*

A topic be given to each candidate in the beginning of clinical examination. He/she is asked to make a presentation on the topic for 8-10 minutes.

9. ORAL MEDICINE AND RADIOLOGY

OBJECTIVES:

At the end of 3 years of training the candidate should be able to acquire adequate knowledge of the discipline.

Knowledge:

Theoretical, Clinical and practical knowledge of all oral mucosal lesions, skeletal involvement of maxillofacial region, diagnostic procedures pertaining to them and latest information of imaging modules.

Skills:

Three important skills need to be imparted in maxillofacial diseases

1. Diagnostic skill in recognition of oral diseases with radiographic diagnosis and their management
2. Research skills in handling scientific problems pertaining to oral treatment
3. Clinical and Didactic skills in encouraging younger doctors to attain learning objectives

Attitudes:

The positive mental attitude and the persistence of continued learning need to be inculcated

COURSE CONTENTS:

A) Applied Basic Sciences:

Applied Anatomy:

1. Gross anatomy of the face:
   a. Muscles of Facial Expression and Muscles of Mastication
   b. Facial nerve
   c. Facial artery
   d. Facial vein
   e. Parotid gland and its relations
   f. Sub mandibular salivary gland and its relations
2. Neck region:
   a. Triangles of the neck with special reference to Carotid, Digastric triangles and midline structures
   b. Facial spaces
   c. Carotid system of arteries, Vertebral Artery, and Subclavian arteries
   d. Jugular system
      Internal jugular
      External jugular
   e. Lymphatic drainage
   f. Cervical plane
   g. Muscles derived from Pharyngeal arches
   h. Infratemporal fossa in detail and temporomandibular joint
   i. Endocrine glands
      - Pituitary
      - Thyroid
      - Parathyroid
   j. Exocrine glands
      - Parotid
      - Thyroid

- Parathyroid

k. Sympathetic chain
l. Cranial nerves- V, VII, IX, XI, & XII

3. Oral Cavity:
   a. Vestibule and oral cavity proper
   b. Tongue and teeth
   c. Palate – soft and hard
4. Nasal Cavity
   a. Nasal septum
   b. Lateral wall of nasal cavity
   c. Paranasal air sinuses
5. Pharynx:
6. Gross salient features of brain and spinal cord with references to attachment of cranial nerves to the brainstem
   Detailed study of the cranial nerve nuclei of V, VII, IX, X, XI, XII
7. Osteology:
   a) Comparative study of fetal and adult skull
   b) Mandible: Development, ossification, age changes and evaluation of mandible in detail

Embryology:

1. Development of face, palate, nasal septum and nasal cavity, paranasal air sinuses
2. Pharyngeal apparatus in detail including the floor of the primitive pharynx
3. Development of tooth in detail and the age changes
4. Development of salivary glands
5. Congenital anomalies of face must be dealt in detail.

Histology:

1. Study of epithelium of oral cavity and the respiratory tract
2. Connective tissue
3. Muscular tissue
4. Nervous tissue
5. Blood vessels
6. Cartilage
7. Bone and tooth
8. Tongue
9. Salivary glands
10. Tonsil, thymus, lymph nodes

Physiology:

1. General Physiology:
   a. Cell
   b. Body Fluid Compartments
   c. Classification
   d. Composition
   e. Cellular transport
   f. RMP and action potential

2. Muscle Nerve Physiology:
   a. Structure of a neuron and properties of nerve fibers
   b. Structure of muscle fibers and properties of muscle fibers
   c. Neuromuscular transmission
   d. Mechanism of muscle contraction

3. Blood:

a. RBC and Hb
b. WBC – Structure and functions
c. Platelets – functions and applied aspects
d. Plasma proteins
e. Blood Coagulation with applied aspects
f. Blood groups
g. Lymph and applied aspects

4. Respiratory System:
   a. Air passages, composition of air, dead space, mechanics of respiration with pressure and volume changes
   b. Lung volumes and capacities and applied aspects
   c. Oxygen and carbon dioxide transport
   d. Neural regulation of respiration
   e. Chemical regulation of respiration
   f. Hypoxia, effects of increased barometric pressure and decreased barometric pressure

5. Cardio-Vascular System:
   a. Cardiac Cycle
   b. Regulation of heart rate/ Stroke volume / cardiac output / blood flow
   c. Regulation of blood pressure
   d. Shock, hypertension, cardiac failure

6. Excretory System:
   a. Renal function tests

7. Gastro – intestinal tract:
   a. Composition, functions and regulation of:
      - Saliva
      - Gastric juice
      - Pancreatic juice
      - Bile and intestinal juice
      - Mastication and deglutition

8. Endocrine System:
   a. Hormones – classification and mechanism of action
   b. Hypothalamic and pituitary hormones
   c. Thyroid hormones
   d. Parathyroid hormones and calcium homeostasis
   e. Pancreatic hormones
   f. Adrenal hormones

9. Central Nervous System:
   a. Ascending tract with special references to pain pathway

10. Special Senses:
    a. Gustation and Olfaction

Biochemistry:

1. Carbohydrates – Disaccharides specifically maltose, lactose, sucrose
   a. Digestion of starch/absorption of glucose
   b. Metabolism of glucose, specifically glycolysis, TCA cycle, gluconeogenesis
   c. Blood sugar regulation
   d. Glycogen storage regulation

e. Glycogen storage diseases
f. Galactosemia and fructosemia

2. Lipids
   a. Fatty acids- Essential/non essential
   b. Metabolism of fatty acids- oxidation, ketone body formation, utilization ketosis
   c. Outline of cholesterol metabolism- synthesis and products formed from cholesterol

3. Protein
   a. Amino acids- essential/non essential, complete/ incomplete proteins
   b. Transamination/ Deamination (Definition with examples)
   c. Urea cycle
   d. Tyrosine-Hormones synthesized from tyrosine
   e. In born errors of amino acid metabolism
   f. Methionine and transmethylation

4. Nucleic Acids
   a. Purines/Pyrimidines
   b. Purine analogs in medicine
   c. DNA/RNA – Outline of structure
   d. Transcription/translation
   e. Steps of protein synthesis
   f. Inhibitors of protein synthesis
   g. Regulation of gene function

5. Minerals
   a. Calcium/Phosphorus metabolism specifically regulation of serum calcium levels
   b. Iron metabolism
   c. Iodine metabolism
   d. Trace elements in nutrition

6. Energy Metabolism
   a. Basal metabolic rate
   b. Specific dynamic action (SDA) of foods

7. Vitamins
   a. Mainly these vitamins and their metabolic role- specifically vitamin A, Vitamin C, Vitamin D, Thiamin, Riboflavin, Niacin, Pyridoxine

Pathology:

1. Inflammation:
   a. Repair and regeneration, necrosis and gangrene
   b. Role of complement system in acute inflammation
   c. Role of arachidonic acid and its metabolites in acute inflammation
   d. Growth factors in acute inflammation
   e. Role of molecular events in cell growth and intercellular signaling cell surface receptors
   f. Role of NSAIDS in inflammation
   g. Cellular changes in radiation injury and its manifestations

2. Homeostasis:

   a. Role of Endothelium in thrombo genesis
   b. Arterial and venous thrombi
   c. Disseminated Intravascular Coagulation

d. Shock:Pathogenesis of hemorrhagic, neurogenic, septic, cardiogenic shock, circulatory disturbances, ischemic hyperemia, venous congestion, edema, infarction

3. Chromosomal Abnormalities:

   a. Marfan's syndrome
   b. Ehler's Danlos Syndrome
   c. Fragile X Syndrome

4. Hypersensitivity:

   a. Anaphylaxis
   b. Type II Hypersensitivity
   c. Type III Hypersensitivity
   d. Cell mediated Reaction and its clinical importance
   e. Systemic Lupus Erythmatosus
   f. Infection and infective granulomas

5. Neoplasia:

   a. Classification of Tumors
   b. Carcinogenesis & Carcinogens – Chemical, Viral and Microbial
   c. Grading and Staging of Cancer, tumor Angiogenesis, Paraneoplastic Syndrome
   d. Spread of tumors
   e. Characteristics of benign and malignant tumors

6. Others:

   a. Sex linked agamaglobulinemia
   b. AIDS
   c. Management of Immune deficiency patients requiring surgical procedures
   d. De George's Syndrome
   e. Ghons complex, post primary pulmonary tuberculosis – pathology and pathogenesis

Pharmacology:

1. Definition of terminologies used
2. Dosage and mode of administration of drugs
3. Action and fate of drugs in the body
4. Drugs acting on CNS
5. Drug addiction, tolerance and hypersensitive reactions
6. General and local anesthetics, hypnotics, antiepileptics and tranquilizers
7. Chemotherapeutics and antibiotics
8. Analgesics and anti – pyretics
9. Anti – tubercular and anti – syphilitic drugs
10. Antiseptics, sialogogues, and anti – sialogogues
11. Haematinics
12. Anti – diabetics
13. Vitamins – A, B Complex, C, D, E & K
14. Steroids

B) Oral and Maxillofacial Radiology:

Study includes Seminars / lectures / Demonstrations

1. History of radiology, structure of x – ray tube, production of x – ray, property of x – rays

2. Biological effects of radiation
3. Films and recording media
4. Processing of image in radiology
5. Design of x –ray department, dark room and use of automatic processing units
6. Localization by radiographic techniques
7. Faults of dental radiographs and concept of ideal radiograph
8. Quality assurance and audit in dental radiology
9. Extra – oral-imaging techniques
10. OPG and other radiologic techniques
11. Advanced imaging techniques like **CBCT,**CT Scan, MRI, Ultrasound
12. Basic Anatomy of sectional imaging with case interpretations of CT / CBCT / MRI
13. Radio nucleotide techniques
14. Contrast radiography in salivary gland, TMJ, and other radiolucent pathologies
15. Radiation protection and ICRP guidelines
16. Art of radiographic report, writing and descriptors preferred in reports
17. Radiograph differential diagnosis of radiolucent, radio opaque and mixed lesions
18. Digital radiology and its various types of advantages

C) Oral Medicine, therapeutics and laboratory investigations:

Study includes seminars / lectures / discussion

1. Methods of clinical diagnosis of oral and systemic diseases as applicable to oral tissues including modern diagnostic techniques
2. Laboratory investigations including special investigations of oral and oro – facial diseases
3. Teeth in local and systemic diseases, congenital, and hereditary disorders
4. Oral manifestations of systemic diseases
5. Oro – facial pain
6. Psychosomatic aspects of oral diseases
7. Management of medically compromised patients including medical emergencies in the dental chair
8. Congenital and Hereditary disorders involving tissues of oro facial region
9. Systemic diseases due to oral foci of infection
10. Hematological, Dermatological, Metabolic, Nutritional, & Endocrinal conditions with oral manifestations
11. Neuromuscular diseases affecting oro –facial region
12. Salivary gland disorders
13. Tongue in oral and systemic diseases
14. TMJ dysfunction and diseases
15. Concept of immunity as related to oro – facial lesions, including AIDS
16. Cysts, Neoplasms, Odontomes, and fibro – osseous lesions
17. Oral changes in Osteo – dystrophies and chondro – dystrophies
18. Pre malignant and malignant lesions of oro facial region
19. Allergy and other miscellaneous conditions
20. Therapeutics in oral medicine –clinical pharmacology
21. Forensic odontology
22. Computers in oral diagnosis and imaging
23. Evidence based oral care in treatment planning
24. Molecular Biology

Essential Knowledge:

Basic medical subjects, Oral Medicine, Clinical Dentistry, Management of Medical Emergencies, Oral Radiology techniques and Interpretation, Diagnosis of Oro – facial disorders

Procedural and Operative Skills:

1st Year:

1. Examination of Patient	- Case history recordings	–	100
	- FNAC	–	50
	- Biopsy	–	50
	- Observe, Assist, & Perform under supervision		
2. Intra – oral radiographs:			
	- Perform and interpretation	–	500
3. Full mouth intra oral radiograph tracings		–	3
4. Age estimation using radiographs		–	10

2nd Year:

1. Dental treatment to medically compromised patients		–	2
- Observe, assist, and perform under supervision			
2. Extra oral radiographs, digital radiography		–	20
- Observe, assist and perform under supervision, Interpretation			
3. Extra Oral radiographs tracings		–	3
4. CBCT Interpretations	–	5	

Operative skills:

1. Giving intra muscular and intravenous injections
2. Administration of oxygen and life saving drugs to the patients
3. Performing basic CPR and certification by Red Cross or similar authorized organization

3rd Year

All the above

-	Performed independently – Case history: Routine cases	–		100
-	Interesting Cases	–		25
-	OPG	–		50
-	Periapical view	–		100
-	Bitewing view	–		50
-	Occlusal view	–		50
-	Extra – oral radiographs of different views	–		**25**
-	CBCT Interpretations	–	10	
-	Treatment of mucosal lesions with LASER	–	3	

Monitoring Learning Progress:

It is essential to monitor the learning progress of each candidate through continuous appraisal and regular assessment. It not only helps teachers to evaluate students, but also students to evaluate themselves. The monitoring is to be done by the staff of the department based on participation of students in various teaching / learning activities. It may be structured and assessment be done using checklists that assess various aspects. Checklists are given in Section IV

Schemes of Examination:

A. Theory:	Part-I: Basic Sciences Paper	-	**100 Marks**
	Part-II: Paper-I, Paper-II & Paper-III	-	**300 Marks**
			(100 Marks for each Paper)

Written examination shall consist of Basic Sciences Paper (Part-I) of three hours duration and should be conducted at the end of First year of MDS course. Part-II Examination will be conducted at the end of Third year of MDS course. Part-II Examination will consist of Paper-I, Paper-II & Paper-III, each of three hours duration. Paper-I & Paper-II shall consist of two long answer questions carrying 25 marks each and five questions carrying 10 marks each. Paper-III will be on Essays. In Paper-III three Questions will be given and student has to answer any two questions. Each question carries 50 marks. Questions on recent advances may be asked in any or all the papers. Distribution of topics for each paper will be as follows: *

PART-I : **Applied Basic Sciences:**Applied Basic Sciences:Applied Anatomy, Physiology, & Biochemistry, Pathology, Microbiology, Pharmacology, Research Methodology and Biostatistics

PART-II :

Paper-I : Oral and Maxillofacial Radiology
Paper-II : Oral Medicine, therapeutics and laboratory investigations
Paper-III : Essays (descriptive and analyzing type questions)

** The topics assigned to the different papers are generally evaluated under those sections. However a strict division of the subject may not be possible and some overlapping of topics is inevitable. Students should be prepared to answer overlapping topics.*

B. Practical / Clinical Examination **: 200 Marks**

1st Day

Clinical Case Presentation	
2 Spotters	2 x 10 = 20 Marks
2 Short Cases	2 x 15 = 30 Marks
1 Long Case	1 x 50 = 50 Marks
	Total = 100 Marks

Radiology Exercise

I. A) One Intra Oral Radiograph : 10 Marks
B) One Occlusal Radiograph :30 Marks

II. A) Two Extra Oral Radiograph :2 x 30 = 60 Marks
Including technique and interpretation

2nd Day

C. Viva Voce **: 100 Marks**

i. Viva-Voce examination : 80 marks

All examiners will conduct viva-voce conjointly on candidate's comprehension, analytical approach, expression, interpretation of data and communication skills. It includes all components of course contents. It includes presentation and discussion on dissertation also.

ii. Pedagogy Exercise : 20 marks

A topic be given to each candidate in the beginning of clinical examination. He/she is asked to make a presentation on the topic for 8-10 minutes.

REGULATIONS 2016

SYLLABUS

for Courses affiliated to the

Kerala University of Health Sciences

Thrissur 680596

Bachelor of Dental Surgery [B.D.S]

Course Code 002

(2016-17 Academic year onwards)

2016

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2. Course Content

2.1. Title of course:

Bachelor of Dental Surgery (B.D.S)

2.2. Aims & Objectives of BDS Course

A. Aims:

To create a graduate in Dental Science who has adequate knowledge, necessary skills and such attitudes which are required for carrying out all the activities appropriate to general dental practice involving the prevention, diagnosis and treatment of anomalies and diseases of the teeth, mouth, jaws and associated tissues. The graduate should also understand the concept of community oral health education and be able to participate in the rural health care delivery programmes existing in the country.

B. Objectives:

The objectives are dealt under three headings namely (a) knowledge and understanding (b) skills and (c) attitudes.

(a) ***Knowledge and understanding***

The student should acquire the following during the period of training.

1. Adequate knowledge of the scientific foundations on which dentistry is based and good understanding of various relevant scientific methods and principles of biological functions.
2. Adequate knowledge to evaluate and analyse scientifically various established facts and data.
3. Adequate knowledge of the development, structure and function of teeth, mouth, jaws and associated tissues both in health and disease and their relationship and effect on general state of health and also their bearing on physical and social well-being of the patient.
4. Adequate knowledge of clinical disciplines and methods, which provide a coherent picture of anomalies, lesions and diseases of the teeth, mouth and jaws.
5. Adequate knowledge on the preventive, diagnostic and therapeutic aspects of dentistry.
6. Adequate knowledge on laboratory steps involved in dental treatment.
7. Adequate clinical experience required for general dental practice.

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8. Adequate knowledge of biological function and behavior of persons in health and sickness as well as the influence of natural and social environment on the state of health so far as it affects dentistry.

(b) ***Skills***

A graduate should be able to demonstrate the following skills necessary for practice of dentistry:

1. Able to diagnose and manage various common dental problems encountered in general dental practice, keeping in mind the expectations and the right of the society to receive the best available treatment wherever possible.
2. Acquire skill to prevent and manage complications if any encountered while carrying out various dental surgical and other procedures.
3. Possess skill to carry out required investigative procedures and ability to interpret laboratory findings.
4. Acquire skill in laboratory procedures involved in dental treatment.
5. Promote oral health and help to prevent oral diseases wherever possible.
6. Competent in control of pain and anxiety during dental treatment.

(c) ***Attitudes***

A graduate should develop during the training period the following attitudes.

1. Willing to apply current knowledge of dentistry in the best interest of the patients and the community.
2. Maintain a high standard of professional ethics and conduct and apply these in all aspects of professional life.
3. Seek to improve awareness and provide possible solutions for oral health problems and needs throughout the community.
4. Willingness to participate in the continuing education programmes to update knowledge and professional skills from time to time.
5. To help and to participate in the implementation of national health programmes.

C. *Goals of BDS Curriculum*

On completion of the undergraduate training program the graduates shall be competent in the following. –

i. General Skills

- Apply knowledge & skills in day to day practice.
- Apply principles of ethics.
- Analyze the outcome of treatment.
- Evaluate the scientific literature and information to decide the treatment.

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- Participate and involve in professional bodies.
- Be capable of self-assessment and be willing to update the knowledge & skills from time to time.
- Inclined to do simple research projects.
- Acquire minimum computer proficiency to enhance knowledge and skills.
- Be aware of one's limitations and know when to refer patients to specialists.
- Be familiar with basic Forensic Odontology techniques and manage Geriatric dental problems.
- Death certification

ii. Practice Management

- Evaluate practice location, population dynamics & reimbursement mechanism.
- Able to communicate freely, orally and in writing with all concerned.
- Maintain records.
- Implement & monitor infection control and environmental safety programs.
- Practice within the scope of one's competence Communication & Community Resources.
- Assess patient's goals, values and concerns to establish rapport and guide patient care.
- Co-ordinate & supervise the activities of allied dental health personnel.
- Participate in improving the oral health of the individuals through community activities.

iii. Patient Care – Diagnosis

- Obtaining patient's history in a methodical way.
- Performing thorough clinical examination.
- Selection and interpretation of clinical, radiological and other diagnostic information.
- Obtaining appropriate consultation.
- Arriving at provisional, differential and final diagnosis.

iv. Patient Care - Treatment Planning

- Integrate multiple disciplines into an individual comprehensive sequenced treatment plan using diagnostic and prognostic information.
- Be able to order appropriate investigations.

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v. Patient Care – Treatment

- Recognition and initial management of medical emergencies that may occur during Dental treatment.
- Perform basic cardiac life support.
- Management of pain including post operative.
- Administration of all forms of local anesthesia.
- Administration of intra muscular and venous injections.
- Prescription of drugs, pre operative, prophylactic and therapeutic requirements.
- Uncomplicated extraction of teeth.
- Transalveolar extractions and removal of simple impacted teeth.
- Minor oral surgical procedures.
- Management of Oro-facial infections.
- Simple orthodontic appliance therapy.
- Taking, processing and interpretation of various types of intra oral radiographs.
- Various kinds of restorative procedures using different materials available.
- Simple endodontic procedures.
- Removable and basic fixed Prosthodontics.
- Various kinds of periodontal therapy.

D. *Competencies Expected- Specialty wise*

ORAL MEDICINE & RADIOLOGY

On completion of the undergraduate training programme the graduate should:

- Be able to identify the common dental problems like dental caries and periodontal disease and their sequelae
- Be able to differentiate the normal variations and oral mucosal lesions
- Be able to identify pre cancerous and cancerous lesions of the oral cavity and refer to the concerned specialty for their management.
- Have an adequate knowledge about common laboratory investigations and interpretation of their results.
- Have adequate knowledge about medical complications that can arise while treating systemically compromised patients and take prior precautions/ consent from the concerned medical specialist.

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- To formulate a clinical diagnosis, order investigations, seek expert consultations to come to a final diagnosis and chart out a proper treatment plan for patients with oral lesions.
- Have adequate knowledge about radiation health hazards, radiation safety and protection.
- Be competent to take intra-oral radiographs and interpret the radiographic findings
- Gain adequate knowledge of various extra-oral radiographic procedures, TMJ radiography and sialography.
- Be aware of the importance of intra- and extra-oral radiographs in forensic identification and age estimation.
- Be familiar with jurisprudence, ethics and understand the significance of dental records with respect to law.

ORAL & MAXILLOFACIAL SURGERY

On completion of the undergraduate training programme the graduate should:

- Be able to apply the knowledge gained in the basic medical and clinical subjects in the management of patients with surgical problems.
- Be able to diagnose, manage and treat patients with basic oral surgical problem
- Have a broad knowledge of maxillofacial surgery and oral Implantology.
- Be familiar with legal, ethical and moral issues pertaining to patient care and communication skills.
- Have acquired the skill to examine any patient with an oral surgical problem in an orderly manner.
- Understand and practice the basic principles of asepsis and sterilization.
- Be competent in the extraction of the teeth under local anesthesia.
- Be Competent to carry out certain minor oral surgical procedures under Local Anesthesia like trans-alveolar extraction, frenectomy, Dentoalveolar procedures, simple impaction, biopsy, etc.
- Be Competent to assess, prevent and manage common complications that arise during and after minor oral surgery.
- Able to provide primary care and manage medical emergencies in the dental office.
- Be familiar with the management of major oral surgical problems and principles involved in the in-patient management.
- Be able to Certify Death

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PERIODONTOLOGY

On completion of the undergraduate training programme the graduate should:

- Be able to diagnose the patient's periodontal problem, plan and perform appropriate periodontal treatment.
- Be Competent to educate and motivate the patient.
- Be Competent to perform thorough oral prophylaxis, subgingival scaling, root planning and minor periodontal surgical procedures.
- Give proper post treatment instructions and do periodic recall and evaluation.
- Be Familiar with concepts of osseointegration and basic surgical aspects of implantology.

CONSERVATIVE DENTISTRY AND ENDODONTICS

On completion of the undergraduate training programme the graduate should:

- Be Competent to diagnose all carious lesions.
- Be Competent to perform Class I and Class II cavities and their restoration with amalgam.
- Be able to restore class V and Class III cavities with glass ionomer cement.
- Be able to diagnose and appropriately treat pulpally involved teeth (pulp capping procedures).
- Be able to perform RCT for anterior teeth
- Be competent to carry out small composite restorations
- Understand the principles of aesthetic dental procedures

ORTHODONTICS AND DENTOFACIAL ORTHOPAEDICS

On completion of the undergraduate training programme the graduate should:

- Understand about normal growth and development of facial skeleton and dentition.
- Be able to pinpoint aberrations in growth process both dental and skeletal and plan necessary treatment
- Be able to diagnose the various malocclusion categories
- Be able to motivate and explain to the patient and parent/guardian about the necessity of treatment
- Be able to plan and execute preventive orthodontics (space maintainers or space regainers)
- Be able to plan and execute interceptive orthodontics (habit breaking appliances)

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- Be able to manage treatment of simple malocclusion such as anterior spacing using removable appliances
- Be able to handle delivery and activation of removable orthodontic/myofacial appliances.
- Be able to diagnose and appropriately refer patients with complex malocclusion to the specialist.

PUBLIC HEALTH DENTISTRY

On completion of the undergraduate training programme the graduate should:

- Apply the principles of health promotion and disease prevention.
- Have knowledge of the organization and provision of health care in community and in the hospital service
- Have knowledge of the prevalence of common dental conditions in India
- Have knowledge of community based preventive measures
- Have knowledge of the social, cultural and environmental factors, which contribute to health or illness.
- Be able to administer hygiene instructions, topical fluoride therapy and fissure sealing.
- Be able to educate patients concerning the etiology and prevention of oral disease and encourage them to assure responsibility for their oral health.

PROSTHODONTICS AND CROWN & BRIDGE

On completion of the undergraduate training programme the graduate should:

- Be able to understand and use various dental materials.
- Be competent to carry out treatment of conventional Simple complete and partial removable dentures and anterior crowns.
- Be able to carry out Prosthodontic laboratory procedures.
- Be familiar with the concepts of osseointegration and the value of implant-supported Prosthodontic procedures.
- Be able to diagnose and appropriately refer patients requiring complex treatment procedures to the specialist

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PAEDIATRIC AND PREVENTIVE DENTISTRY

On completion of the undergraduate training programme the graduate should:

- Be able to instill a positive attitude and behavior in children towards oral health and understand the principles of prevention and preventive dentistry right from birth to adolescence.
- Be able to guide and counsel the parents/guardian in regards to various treatment modalities including different facets of preventive dentistry.
- Be able to treat dental diseases occurring in child patient.
- Be able to manage the physically and mentally challenged / disabled children effectively and efficiently, tailored to the needs of individual requirement and conditions.

2.3 Medium of Instruction

The medium of Instruction and examinations of BDS course will be in English language.

2.4 General Outline of BDS Degree Course

1) The undergraduate course involves organisation of year-wise teaching program. However, this course, as a whole, should demonstrate integration of the basic sciences, clinical dentistry and practical or laboratory skills. The course should be designed and integrated in such a way as to permit smooth progression from pre-clinical to clinical phase. Collaboration should be encouraged between teachers of basic sciences, dental sciences and clinical subjects.

2) The undergraduate dental course consists of three main components. The first component consists subjects common to modern medicine and dentistry like anatomy, physiology, biochemistry and behavioral science, leading to pharmacology, pathology, microbiology and then on to general medicine and general surgery. The second component runs concurrently with the first and deals with special aspects of oral and dental tissues, oral biology and oral pathology. Finally, the third component based on the foundations of the first two, deals with the clinical and technical aspects of dentistry as is required for general dental practice.

3) The first component of the course is intended to provide initially, an appreciation of normal human structure, development, function and behavior, leading to understanding of the diseases, its prevention and treatment. The main objective is to provide student with a broad knowledge of normal structures and functions of the body, the alterations which take place in disease with particular reference to those conditions in which medical and dental co-operation

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is essential for proper management. At this stage, the student should also be made aware of the social and psychological aspects of patient care with special reference to the relationship between dentist and patient. The behavioral sciences including both sociology and psychology should be introduced at the initial stages of the training program, much before the students actually deal with the patients.

4) The second component of dental undergraduate program includes instruction in the subjects dealing with dental and oral aspects to ensure a detailed knowledge of the structure and function of the dental and oral tissues. This enables the student to diagnose, prevent and treat the dental and oral diseases and disorders, which were not included in the first component. The subject of oral biology is to be introduced at this level to provide the students a comprehensive knowledge and application of oral physiology, microbiology, biochemistry and oral immunology. Students should be exposed to the basic aspects of forensic odontology at this stage of the course along with oral biology/oral pathology.

5) The third component of the course comprising the clinical and technical aspects of dentistry actually prepares the student to undertake total oral and dental health care of patients of all ages. The emphasis at this stage should be on the prevention of the various dental diseases and how to preserve natural teeth with their supporting structures. The importance of various preventive methods needs to be stressed. The significance of diagnosis of various dental and oral problems needs to be emphasized along with treatment planning before actual treatment procedures are undertaken. In addition to acquiring the knowledge, the students need to gain adequate clinical hands-on-experience in extractions and other minor oral surgical procedures, all aspects of Conservative Dentistry, Endodontics, Crown and Bridge, provision of partial and complete dentures, various periodontal therapeutic procedures and use of removable orthodontic appliances. Familiarity with various radiological techniques, particularly intra-oral methods and proper interpretation of the radiographs, is an essential part of this component of training and has application in clinical diagnosis, forensic identification and age estimation. Training in handling medico-legal cases including death certification should be imparted at this stage. Towards the final stage of the clinical training, each student should be involved in comprehensive oral health care or holistic approach to enable him or her to plan and treat patients as a whole, instead of piece-meal treatment provided in each specialty. The aim of the undergraduate program should undoubtedly be to produce a graduate, competent in general dental practice.

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6) The commitment towards the society as a whole needs to be stressed along with the knowledge and treatment skills gained. Instruction in public health dentistry should emphasise the sociological aspects of health care and palliative care particularly; oral health care, including the reasons for variation in oral and dental needs of different sections of the society. It is important to know the influence of social, behavioral, environmental and economic factors on oral and dental health. Students should be made aware of the National oral health Policy and the importance of being a member of the Health care team delivering medical and oral health care particularly among rural population. Students should also be encouraged to participate in simple research project work

7) The undergraduate curriculum stresses the significance of infection and cross infection control in dental practice. Aspects like sources of infection, measures to be adopted both general and specific for control, particularly the HIV and hepatitis is incorporated in the curriculum so that the graduates are aware of its significance and follow it in their practice.

8) The information technology has touched every aspect of an individual's personal and professional life. The University hence recommends that all undergraduates acquire minimum computer proficiency, which will enable them to enhance their professional knowledge and skills.

2.5 Duration & course of Study

1. The undergraduate dental training program leading to B.D.S. degree shall be of four and a half years duration in addition to one year compulsory paid rotating internship. During this period, the students shall be required to engage in full time study at a Dental college recognized or approved by the Dental Council of India. During the first four and a half years of undergraduate course, the instruction in clinical subjects should be at least for two and a half years.

2. Basic Medical & Dental Subjects

   The basic medical and dental sciences comprise of Anatomy - Gross and Microscopic, Physiology, Biochemistry, Pharmacology, science of Dental Materials and Oral biology. Subjects like behavioral sciences, which would be useful to develop communication skills, should also be introduced in the first year itself and spread over the undergraduate course. An introduction to Public Health Dentistry also will be useful to develop the concept of commitment to community. The laboratory skills like pre-clinical Prosthodontics, Crown and Bridge, Conservative dentistry and Orthodontics is to be developed by the students.

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Studying dental morphology also is a part of initial training. At the end of this period the student should be in a position to understand and comprehend in general the development, structure and function of the human body in both health and disease.

3. The instruction in basic dental sciences should include theoretical and practical aspects of oral anatomy and physiology, to provide a detailed knowledge of the form and structure of teeth, associated tissues and occlusal relationships. The study should also aim at development of a concept regarding physiological and biochemical processes relevant to oral cavity for better understanding of the changes that occur with the onset of disease in the oral cavity. The student should be made aware of the importance of various dental tissues in forensic investigation.

4. Clinical, Medical and Dental subjects:

The students should be introduced to clinics in the initial stage, preferably in the first year, as an observer to familiarize with clinical set-up and working. The period of instruction in the clinical subjects shall not be less than two and a half years full time. During this, the student shall attend a dental hospital, general hospital, community camps and satellite clinics, in order to obtain instruction and experience in the practice of dentistry. The main objective of training in clinical dental subjects is to produce a graduate, able and competent to recognize or diagnose various dental and oral diseases, to undertake general dental treatment, advice on the provision of specialized treatment available and finally advise the patient on prevention. The student should also understand the relationship between oral and systemic diseases.

5. The general medicine and surgery training should provide sufficient knowledge on human disease to enable the student to understand its manifestations as relevant to the practice of dentistry. This requires clinical teaching on patients and shall be carried out in inpatient and outpatient medical departments and specialist clinics. This clinical instruction should enable the student to understand and perhaps diagnose common systemic diseases, which have relevance to dental practice, by adopting a systematic approach of history taking and clinical examination. The student should also realize the significance of various general and special investigations in the diagnosis of diseases. The ability to recognize physical and mental illness, dealing with emergencies, effective communication with patients, and interaction with professional colleagues also become important aspects of this training.

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6. All dental students should receive instruction in first-aid and principles of cardio-pulmonary resuscitation. The students should also attend to the accident and emergency department of a Medical hospital.

7. The purpose of the clinical training is to provide sufficient practical skill in all aspects of clinical dentistry. The instruction should also include patient management skills, treatment of patients of all ages with special reference to children (paediatric), very elderly (geriatric), medically compromised and disabled patients.

8. During the two and a half years of clinical course, the students should receive thorough instruction which involves history taking, diagnosis and treatment planning in all aspects of dentistry and should be competent on graduation to carry out all routine general procedures. In Oral & Maxillofacial Surgery, instruction should include the knowledge of various maxillofacial problems like injuries, infections and deformities of the jaws and associated structures. The clinical experience should include those procedures commonly undertaken in general practice like extraction of teeth, minor oral surgical procedure etc. In Conservative dentistry and Endodontics, Prosthodontics and Crown & Bridge and Periodontology students should be competent on graduation to carry out routine treatments like restorations of various types, endodontic procedures, removable Prosthodontics, and finally various kinds of periodontal therapy. In Orthodontics & Dentofacial Orthopaedics, students should carry out simple appliance therapy including myofacial appliances for patients. Students should also be able to appreciate the role of Dentofacial growth in the development and treatment of malocclusion. In addition, students should be aware of their limitations on graduation, need to refer patients for consultant opinion and/or treatment and also the need for postgraduate and continuous education programmes.

9. In Paediatric & Preventive Dentistry, the students should concentrate on effective management of the behavior of the child patient to instill a positive attitude, on efficacy of preventive measures and clinical management, including the treatment needs particularly for children with disabilities. In oral medicine and Radiology, the student should receive instruction in various common lesions, occurring in the oral cavity and its diagnosis with particular reference to oral cancer. All students should receive instructions and gain practical experience in taking various types of intra and extra oral radiographs and its processing and interpretation. They should be aware of the hazards of radiation and proper

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protective measures from radiation for the patient, operator and other staff. Since Paediatric dentistry involves the practice of various branches of clinical dentistry, training in Paediatric Dentistry is extended to Part II of the final year.

10. The successful control and management of pain is an integral part of dental practice. Upon graduation the students should be competent to administer all forms of local anesthesia. The value of behavioral methods of anxiety management should be emphasized. The students should also have the practical experience in the administration of intra-muscular and intra-venous injections. Knowledge of pain mechanisms and strategies to control post-operative pain is essential for practice of dentistry.

11. Instruction should be given in dental jurisprudence, legal and ethical obligations of dental practitioners and the constitution and functions of Dental Council of India. Students should be made competent in the management of medico legal cases and death certification.

12. Infection and cross infection control assume significance in dental practice. The students should be made aware of the potential risk of transmission of various infectious diseases particularly HIV and hepatitis in the dental surgery. The students should be aware of their professional responsibility for the protection of the patients, themselves and their staff and the requirements of the health and safety regulations.

13. The subjects of Aesthetic dentistry, Oral Implantology, Behavioral sciences and Forensic Odontology have assumed great significance. Hence, these four specialties are incorporated into the undergraduate curriculum. The instruction and clinical training in aesthetic dentistry shall be carried out by the departments of Prosthodontics and Crown & Bridge and Conservative Dentistry & Endodontics. Similarly, the instruction and clinical training in Oral Implantology shall be done by the departments of Prosthodontics and Crown & Bridge, Oral & Maxillofacial Surgery, and Periodontology. The instruction in behavioral sciences should ideally commence before the students come in contact with the patients and shall be carried out by the departments of Public Health Dentistry and Paediatric and Preventive Dentistry. Forensic Odontology including procedures of death certification will be a part of Oral Pathology & Oral Microbiology, Oral Medicine & Radiology and Oral & Maxillofacial Surgery.

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14. With increased life expectancy and treatment facilities, Palliative care has gained importance in the modern world. Palliative medicine is the branch of medicine involved in treatment of patients with advanced, progressive, life-threatening disease for whom the focus of care is maximising their quality of life through expert symptom management, psychological, social and spiritual support as part of a multi-professional team. Understanding the role of dental surgeon in the field of palliative care this subject is introduced in the syllabus to be handled by faculty under public health dentistry trained in palliative care.

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2.6 Syllabus

(The syllabus given below is a guideline and is not intended to restrict the student from learning relevant topics not mentioned herein and is not intended to restrict the examiner in assessing the extent of knowledge of the student in the subject)

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		4) Dental Anatomy, Embryology and Oral histology	40
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	2.	*Year wise split up of hours of study for each subject*	170
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	4.	*Number of Hours per subject*	173
	5.	*Recommended Books*	175

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1. GENERAL HUMAN ANOTMY INCLUDING EMBRYOLOGY AND HISTOLOGY

a) GOAL

The students should gain the knowledge and insight into, the functional anatomy of the normal human head and neck, functional histology and an appreciation of the genetic basis of inheritance and disease, and the embryological development of clinically important structures. So that relevant anatomical & scientific foundations are laid down for the clinical years of the BDS course.

b) OBJECTIVES:

i. Knowledge & understanding:

At the end of the 1st year BDS course in Anatomical Sciences the undergraduate student is expected to:

(1) Know the normal disposition of the structures in the body while clinically examining a patient and while conducting clinical procedures.

(2) Know the anatomical basis of disease and injury.

(3) Know the microscopic structure of the various tissues, a pre-requisite for understanding of the disease processes.

(4) Know the nervous system to locate the site of lesions according to the sensory and or motor deficits encountered.

(5) Have an idea about the basis of abnormal development, critical stages of development, effects of teratogens, genetic mutations and environmental hazards.

(6) Know the sectional anatomy of head neck and brain to read the features in radiographs and pictures taken by modern imaging techniques.

(7) Know the anatomy of cardio-pulmonary resuscitation.

ii. Skills

1) To locate various structures of the body and to mark the topography of the living anatomy.
2) To identify various tissues under microscope.
3) To identify the features in radiographs and modern imaging techniques.
4) To detect various congenital abnormalities.

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c) INTEGRATION

By emphasizing on the relevant information and avoiding unwanted details, the anatomy taught integrally with other basic sciences & clinical subjects not only keeps the curiosity alive in the learner but also lays down the scientific foundation for making a better doctor, a benefit to the society.

This insight is gained in a variety of ways:

i. Lectures & small group teaching
ii. Demonstrations
iii. Dissection of the human cadaver
iv. Study of dissected specimens
v. Osteology
vi. Surface anatomy on living individual
vii. Study of radiographs & other modern imaging techniques.
viii. Study of Histology slides.
ix. Study of embryology models
x. Audio-visual aids

Throughout the course, particular emphasis is placed on the functional correlation, clinical application & on integration with teaching in other bio dental disciplines.

d) AN OUTLINE OF THE COURSE CONTENT:

General anatomy: Introduction of anatomical terms and brief outline of various systems of the body.

i. Regional anatomy of head & neck with Osteology of bones of head & neck, with emphasis on topics of dental importance.
ii. General disposition of thoracic, abdominal & pelvic organs.
iii. The regional anatomy of the sites of intramuscular & intra vascular injections, & lumbar puncture.
iv. General embryology & systemic embryology with respect to development of head & neck.
v. Histology of basic tissues and of the organs of gastrointestinal, respiratory, Endocrine, excretory systems & gonads.
vi. Medical genetics

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e) THEORY: 100 HOURS

	THEORY	
	TOPICS	**HOURS**
1	Introduction to anatomical terms, position, skin, superficial fascia and deep fascia	1
2	Simple epithelium, compound epithelium, Glandular epithelium	1
3	Scalp	1
4	Muscles of facial expression	1
5	Norma verticalis & Norma frontalis	1
6	Norma occiptalis & norma lateralis	1
7	Cervical vertebrae	1
8	Deep cervical fascia	1
9	Development of face	1
10	Brachial plexus	1
11	Classification of joints	1
12	Connective tissue	2
13	Cartilage	1
14	Bone	2
15	Muscle	1
16	Nervous tissue – Neurons, classification, regeneration, optic nerve, sciatic nerve, sensory & autonomic ganglia	2
17	Thyroid gland & development & developmental anomalies	1
18	Lymphatic drainage of head & neck.	1
19	Lacrimal apparatus & eyelid	1
20	Parotid gland & development	1
21	Dural venous sinuses – classification, cavernous sinus in detail	1
22	Pituitary gland and development & anomalies	1
23	Vascular tissue – Large artery, Medium sized artery, Large vein	1
24	Lymphatic tissue	2
25	Skin and its appendages – hair follicle – Sebaceous gland – sweat gland – nail	1
26	Anterior cranial fossa	1
27	Middle cranial fossa	1

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28	Posterior cranial fossa	1
29	Parietal bone	1
30	Occipital bone	1
31	Frontal bone	1
32	Temporal bone	2
33	Norma basalis	2
34	General embryology – oogenesis	1
35	General embryology – spermatogenesis	1
36	General embryology – fertilization	1
37	General embryology – implantation bilaminar	1
38	General embryology – bilaminar germ disc	1
39	General embryology - Neural tube formation, trilaminar germ disc, neural crest, Intraembryonic mesoderm & its fate, Notochord	2
40	General embryology - Folding of embryo	1
41	General embryology - Placenta & foetal membranes	2
42	Pharyngeal pouches & cleft	1
43	Bony orbit	1
44	Muscles of mastication	1
45	Temporomandibular joint	1
46	Hyoglossus muscle and its relations	1
47	Mandible	2
48	Maxilla	2
49	Zygomatic & hyoid bones	1
50	Pharynx	2
51	Nasal cavity & its lateral wall	1
52	Larynx	2
53	Tongue and its development & developmental anomalies	1
54	Middle ear & development	1
55	Coats of the eye – uveal tract in detail	1
56	External features of spinal cord	1
57	Leptomeninges	1
58	Blood supply of brain	1
59	Medulla oblongata– external features	1
60	Pons – external features	1

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61	Cerebellum	1
62	4th ventricle	1
63	Mid brain – external features	1
64	3rd ventricle	1
65	Cerebrum – Sulci, gyri and functional area	1
66	Lateral ventricle	1
67	Optic pathway	1
68	White matter of cerebrum and internal capsule	2
69	Basal ganglia	1
70	III Cranial Nerve & IV Cranial nerves	1
71	V Cranial nerve & VI cranial nerves	1
72	VII cranial nerve	1
73	VIII, IX cranial nerves	1
74	X, XI, XII cranial nerves	1
75	Gastrointestinal system	2
76	Respiratory system	2
77	Cardiovascular system	2
78	Excretory system	2
79	Reproductive system – male (1 hr), female (1 hr)	2
80	Medical genetics – Mitosis, Meiosis, Chromosomes and anomalies	1
81	Medical Genetics - Gene structure and genetic disorders	1
82	Medical Genetics - Mode of inheritance	1

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Sl. No.	SEMINARS
1.	Submandibular gland
2.	Nasal septum
3.	Soft palate
4.	Auditory tube
5.	Otic ganglion
6.	Pterygopalatine ganglion
7.	Submandibular ganglion
8.	Ciliary ganglion
9.	Ansa cervicalis
10.	Internal and external jugular veins
11.	Subclavian artery
12.	Autonomic nervous system
13.	Paranasal air sinuses
14.	Lingual artery
15.	Circle of Willis
16.	Choroid plexuses of the ventricles

f) PRACTICAL: 175 HOURS

Sl. No.	**PRACTICALS**
	HISTOLOGY
1.	Simple epithelium
2.	Compound epithelium
3.	Glandular epithelium
4.	Connective tissue
5.	Cartilage
6.	Bone
7.	Muscle
8.	Neuron – Optic Nerve - Peripheral Nerve
9.	Ganglia
10.	Blood vessels
11.	Lymphatic tissue – Lymph node, - Spleen, - Thymus, - Tonsil

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12.	Skin – Thin skin, Thick skin
13.	Placenta & Umbilical cord
14.	Trachea & lung
15.	Spinal cord, Cerebellum, Cerebrum
16.	Cornea & Retina
17.	Thyroid & Parathyroid gland
18.	Suprarenal & Pituitary glands
19.	Kidney, Ureter, Urinary bladder
20.	Ovary, Corpus luteum, Testis
21.	Tongue – filiform, fungiform, circumvallate papillae
22.	Salivary glands – Mucous – Serious – Mixed
23.	Liver, Pancreas
DISSECTION	
24.	Introduction to dissection
25.	Scalp
26.	Superficial dissection of face – muscles of face
27.	Side of the neck & Posterior triangle
28.	Back of the neck – suboccipital triangle
29.	Anterior triangle
30.	Deep dissection of the neck – Thyroid gland parathyroid gland trachea, oesophagus, Brachiocephalic trunk, Subclavian artery Bracheiocephalic vein Thoracic duct. Cervical pleura Neurovascular bundle of the neck, Sympathetic chain, Scalene muscles; Cervical fascia
31.	Lymph nodes & lymph vessels of head & neck
32.	Prevertebral region – Vertebral artery – Vertebral vein
33.	Deep dissection of face – Facial artery – Other vessels - Nerves
34.	Structures in the cheek & lips
35.	Eyelid & lacrimal apparatus
36.	Parotid region
37.	Cranial cavity –meninges Dural folds, Venous sinuses
38.	Anterior cranial fossa
39.	Middle cranial fossa – Pituitary gland
40.	Posterior cranial fossa
41.	Orbit – structures in the orbit

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42.	Temporal and infratemporal regions
43.	Submandibular region
44.	Mouth and pharynx
45.	Soft palate and Auditory tube
46.	Cavity of the nose
47.	Larynx
48.	Tongue
49.	Organs of hearing & equilibrium – External ear – Middle ear – Internal ear
50.	Eye ball
51.	Joints of the neck
52.	Spinal Cord
53.	Introduction to brain
54.	Meninges of brain
55.	Blood vessels of brain
56.	Base of brain
57.	Hind brain –Medulla
58.	Hind brain – Pons
59.	Hind brain – Cerebellum
60.	4th ventricle
61.	Midbrain
62.	Cerebral hemispheres
63.	White matter of cerebrum
64.	3rd ventricle
65.	Lateral ventricle
66.	Thalami – Optic tract
67.	Deep dissection of cerebral hemisphere & Internal capsule
68.	Deep nuclei and connections of thalamus
DEMONSTRATION OF SPECIMENS	
69.	Thoracic wall Chambers of heart Coronary arteries Pericardium
70.	Lungs Pleural cavity Diaphragm
71.	Abdomen –

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	Peritoneal cavity Organs in abdominal & pelvic cavities
CLINICAL PROCEDURES	
72.	Intramuscular injections Deltoid muscle Gluteal region Quadriceps femoris
73.	Intravenous injection Median cubital vein Cephalic vein Basilic vein Long saplenous vein Short saplenous vein
74.	Arterial pulsations Superficial temporal Facial Carotid Brachial Radial Femoral Dorsalis pedis Lumbar puncture

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g) SCHEME OF EXAMINATION

Distribution of Topics and Type of Questions for University Written examination:

Contents	Types of Questions and Marks	Marks
Questions from any topic included in the theory syllabus	Structured Essays 2x 10marks	20
Questions from any topic included in the theory syllabus Except from the topics from which the long essays have been set	Short Notes 4 x 5marks	20
	Brief Notes 10x3marks	30
	Total	**70**

i. Theory

University Written **70 Marks**

Internal Assessment **10 Marks**

Viva Voce: Examiner 1-Gross Anatomy-

Examiner 2-Osteology, Surface Marking & embryology **20Marks**

ii. Practicals:

University Practical Examination: **80 Marks**

Gross Anatomy including osteology Spotters (2 mark each) *2x 15* *30 Marks*

Discussion on Dissected parts (2 Specimens) *2x15* *30 Marks*

Histology –spotters (10 slides) 2*x10* *20 Marks*

Internal Assessment: **20 Marks**

Grand Total 200 Marks

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2. GENERAL HUMAN PHYSIOLOGY

a) GOAL

The broad goal of the teaching undergraduate students in Physiology aims at providing the student comprehensive knowledge of the normal functions of the organ systems of the body to facilitate an understanding of the physiological basis of health and disease.

b) OBJECTIVES

i. Knowledge

At the end of the course, the student will be able to:

(1) Explain the normal functioning of all the organ systems and their interactions for well co-ordinated total body function.

(2) Assess the relative contribution of each organ system towards the maintenance of the milieu interior.

(3) List the physiological principles underlying the pathogenesis and treatment of disease.

ii. Skills

At the end of the course, the student shall be able to:

(1) Conduct experiments designed for the study of physiological phenomena.

(2) Interpret experimental and investigative data

(3) Distinguish between normal and abnormal data derived as a result of tests which he/she has performed and observed in the laboratory.

iii. Integration

At the end of the integrated teaching the student shall acquire an integrated knowledge of organ structure and function and its regulatory mechanisms.

c) THEORY: 120 Hours

.	**Hours**
1. GENERAL PHYSIOLOGY	
Homeostasis: Basic concept, Feedback mechanisms Structure of cell membrane, transport across cell membrane Body fluid Compartments: distribution of total body water, intracellular & extracellular compartments, major anions & cations in intra and extra cellular fluid. Membrane potentials. RMP & Action Potential.	**4**
2. BLOOD:	**15**
Composition & functions of blood,	

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Plasma proteins - Types, concentration, functions & variations, Erythrocyte: Morphology, functions & variations. Erythropoiesis & factors affecting erythropoiesis, ESR- factors affecting, variations & significance. Haemoglobin - Normal concentration, method of determination [P] & variation in concentration, functions Anaemia - Definition, classification, life span of RBC's destruction of RBC's, formation & fate of bile pigments, Jaundice - types. Leucocytes: Classification, number, percentage, distribution morphology, properties, functions & variation. Role of lymphocytes in immunity, life span & fate of leucocytes. [Mention Leukemia] Thromobocytes - Morphology, number, variations, function. Haemostatsis – Role of vasoconstriction, platelet plug formation in haemostasis, coagulation factors, intrinsic & extrinsic pathways of coagulation, clot retraction. Fibrinolytic system. Tests of haemostatic function, platelet count, clotting time, bleeding time, prothrombin time - normal values, method & variations. Anticoagulants - mechanism of action. Bleeding disorders. Blood groups: ABO & Rh system, method of determination, importance, indications & dangers of blood transfusion, blood substitutes.[mention only] Blood volume: Normal values, variations. Functions of reticulo-endothelial system. Specific gravity, Packed cell volume, Methods of estimation [in practicals] Blood Indices - MCV, MCH, MCHC - definition, normal values, variation. Leucopoiesis Thrombopoiesis.	
3.MUSCLE AND NERVE	**8**
Classification of nerves, Structure of skeletal muscle - Molecular mechanism of muscle contraction, Neuromuscular junction and NM transmission.	

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Properties of skeletal muscle. Structure and properties of cardiac muscle & smooth muscle.	
4. DIGESTIVE SYSTEM :	
Introduction to digestion: General structure of G.I. tract, Innervation. Salivary glands: Saliva: composition, regulation of secretion & functions of saliva. Stomach: Composition and functions of gastric juice, mechanism and regulation of gastric secretion. HCl secretion. Physiological basis of Peptic ulcer management [briefly] Exocrine Pancreas - Structure, composition of pancreatic juice, functions of each component, regulation of pancreatic secretion. Liver : structure , composition of bile, functions of bile Gall bladder: structure, functions. Small intestine - Composition, functions Large intestine - Functions. Motor functions of GIT: Mastication, deglutition, gastric filling & emptying, movements of small and large intestine, defecation.	**10**
5. EXCRETORY SYSTEM :	
Structure & functions of kidney, functional unit of kidney & functions of different parts. Juxta Glomerular apparatus. Special functional features of renal circulation. Formation of Urine: Glomerular filtration rate - definition, normal values, factors influencing G.F.R. Tubular reabsorption - Reabsorption of sodium, glucose, water & other substances. Tubular secretion - secretion of urea, hydrogen and other substances. Countercurrent mechanisms. Micturition: anatomy & innervation of Urinary bladder, mechanism of micturition. Determination of GFR. Role of kidney in the regulation of pH of the blood. Urinary bladder: abnormalities.	**8**
6. SKIN AND TEMPERATURE REGULATION [basics only]	**4**
7. ENDOCRINOLOGY	**14**
General endocrinology- endocrine glands & hormones. Second messengers.	

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Endocrine function of hypothalamus. Hormones of anterior pituitary & their actions, Disorders of secretion of anterior pituitary hormones. Posterior pituitary hormones: actions Thyroid: secretion & transport of hormones, actions of hormones, regulation. Adrenal cortex & Medulla- action, Other hormones - Angiotensin, local hormones Pancreatic Hormone PTH Endocrine Disorders to be taught with each gland.	
8. REPRODUCTION	**6**
Physiological anatomy of male and female sex organs, Gonadotropic hormones. Sex chromatin. Female reproductive system: Menstrual cycle, functions and hormones of ovary. Ovarian and uterine changes during menstrual cycle. Actions of oestrogen &Progesterone control of secretion of ovarian hormones, fertilization, implantation, maternal changes during pregnancy and parturition. Lactation, milk ejection reflex. Male reproductive system, spermatogenesis, hormones-testosterone. Semen. Contraception.	
9. CARDIO VASCULAR SYSTEM	**15**
Functional anatomy and innervation of heart. Properties of cardiac muscle. Origin & propagation of cardiac impulse and Pacemaker potential. Action potential. Cardiac cycle - Phases, Pressure changes in atria, ventricles & aorta. Volume changes in ventricles. Heart sounds. Jugular venous pulse Arterial pulse. Electrocardiogram- Basic principles only. Normal electrocardiogram. Heart rate: Normal value, variation. Stroke volume and Cardiac output: definition, normal values, variations, factors affecting. Arterial blood pressure: Definition, normal values, variations, determinants. Regulation of heart rate, stroke volume, blood pressure: integrated concept.	

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Coronary circulation: special features. Cardiac murmurs Cardiac output: one method of determination Cardio vascular homeostasis in exercise & posture.	
10. RESPIRATORY SYSTEM	
Physiology of Respiration: External & internal respiration. Functional anatomy of respiratory passage & lungs. Respiratory movements: Muscles of respiration, Mechanism of inflation & deflation of lungs. Intra pleural & intra pulmonary pressures & their changes during the phases of respiration. Mechanics of breathing - surfactant, compliance & work of breathing [basics only]. Spirometry: Lung volumes & capacities definition, normal values, significance, factors affecting vital capacity, variations in vital capacity, Pulmonary ventilation- alveolar ventilation & dead space-ventilation. Pulmonary circulation: Functional features. Composition of inspired air, alveolar air and expired air. Exchange of gases: Diffusing capacity, factors affecting it. Transport of Oxygen & carbon dioxide in the blood. Regulation of respiration- neural & chemical. Hypoxia, cyanosis, dyspnoea, periodic breathing. Artificial respiration. FEV & its variations. Pulmonary function tests Respiratory changes during exercise	**12**
11. CENTRAL NERVOUS SYSTEM	
Organisation of central nervous system Neuronal organisation at spinal cord level, Synapse: functional significance. Receptors, reflexes, sensations and sensory tracts, motor system Physiology of pain. Referred pain. Analgesia systems. Functions of thalamus, cerebellum. Vestibular apparatus [basics only] Cerebral cortex: Basics of higher functions. Formation and functions of CSF: clinical significance. Autonomic nervous system	**10**

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12. SPECIAL SENSES	
Fundamental knowledge of vision, hearing, taste and smell. Errors of refraction. Tests of auditory function .	**14**

d) PRACTICALS

The following list of practical is minimum and essential. The entire practical have been categorized as procedures and demonstrations. The procedures are to be performed by the students during practical classes to acquire skills. All the procedures are to be included in the University practical examination. Those categorized as demonstrations are to be shown to the students during practical classes. However these demonstrations would not be included in the University examinations but question based on this would be given in the form of charts, graphs and calculations for interpretation by the students.

Practicals & demonstrations: 60 hours

Practicals	Hours
Study of Microscope and its uses	02
Collection of blood and study of haemocytometer	02
Haemoglobinometry	02
Determination of RB count	08
Determination of WBC count	04
Determination of blood groups	02
Leishman's staining and differential leucocyte count	10
Calculation of blood indices	02
Determination of bleeding time	01
Determination of clotting time	01
Blood pressure recording	03
Auscultation of Heart sounds	02
Demonstrations	
Determination of Erythrocyte Sedimentation rate(ESR)	02
Determination of packed cell volume(PCV)	02
Determination of specific gravity of blood	02
Fragility test for RBC	02
Clinical examination of Cardiovascular and Respiratory System	03
Determination of vital capacity	02
Artificial respiration	02
Demonstration of deep and superficial reflexes	02
Activity of frog's heart and effects of Acetylcholine, Atropine and	02
Electrocardiography: Demonstration of recording of normal Electro	02
Total	**60**

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e) SCHEME OF EXAMINATION

Types of Questions for written examination

Type of Questions	Marks
Structured Essays 1x 10 marks	10
Short Notes 2 x 5 marks	10
Brief Notes 5 x 3 marks	15
Total	**35**

i. ***Theory:***

University written Examination: **35Marks**
University Viva: **10Marks**
Internal Assessment: **5 Marks**
Total: 50 Marks

ii. ***Practicals:***

Internal Assessment: **10 Marks**
University Practicals: **40Marks**
Total: 50 Marks
Grand Total 100Marks

Mark distribution for University practical examination

Major Experiments: **20Marks**

Any one of the Major Experiments: R.B.C. Count, W.B.C. Count, Differential Count, Blood Pressure Recording

Minor Experiments: **15Marks**

Any one of the minor Experiments: Determination of Blood Groups, Determination of Bleeding & Clotting time, Haemoglobin Estimation, Calculation of absolute Hematological Indices–MCH, MCV, MCHC

Practical Work record: **5 Marks**

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3. BIOCHEMISTRY, NUTRITION AND DIETETICS

a) AIMS AND SCOPE

The major aim is to provide a sound but crisp knowledge on the biochemical basis of the life processes relevant to the human system and to dental/medical practice. The contents should be organized to build on the already existing information available to the students in the pre-university stage and reorienting. A mere rehash should be avoided.

The chemistry portion should strive towards providing information on the functional groups, hydrophobic and hydrophilic moieties and weak valence forces that organise macromolecules. Details on structure need not be emphasised.

Discussion on metabolic processes should put emphasis on the overall change, interdependence and molecular turnover. While details of the steps may be given, the student should not be expected to memorise them. An introduction to biochemical genetics and molecular biology is a must but details should be avoided. The exposure to antivitamins, antimetabolites and enzyme inhibitors at this stage, will provide a basis for the future study of medical subjects. An overview of metabolic regulation is to be taught by covering hormonal action, second messengers and regulation of enzyme activities. Medical aspects of biochemistry should avoid describing innumerable functional tests, most of which are not in vogue. Cataloguing genetic disorders under each head of metabolism is unnecessary. A few examples which correlate genotype change to functional changes should be adequate.

At the end of the course the student would be able to acquire a useful core of information, which can be retained for a long time.

b) THEORY: 70 HOURS

No.	TOPIC	HOURS ALLOTTED
1	**CARBOHYDRATES**	**12 hours**
	Definition, biological importance and classification. Monosaccharide's –Glucose, fructose, galactose, mannose	1
	Reactions: reducing property, oxidation, osazone, Molisch test. Define anomerism, epimerism with examples.	1
	Disaccharides-lactose, maltose, sucrose, Glycosidic bond, amino sugars, deoxy sugars	1
	Polysaccharides. Structures of starch and glycogen, Mucopolysaccharides (definition, name, components, biochemical	1

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	significance. *nature of linkages not required*) Dietary fibers.	
	Digestion and absorption of carbohydrates. associated disorders(in brief)	1
	Glycolysis, fates of pyruvate Gluconeogenesis.	2
	Glycogenesis, glycogenolysis,	2
	Significance of pentose phosphate pathway. Importance of glucuronic acid.	1
	Regulation of blood glucose. Diabetes mellitus: impaired fasting glucose, impaired glucose tolerance, gestational diabetes mellitus. Evaluation of glycemic status.	2
2	**LIPIDS**	**9 hours**
	Definition, biological importance and classification. Fats and fatty acids. Essential fatty acids. Introduction to compound lipids. Cholesterol.	2
	Digestion and absorption of lipids	1
	Beta oxidation of fatty acids	1
	Fatty acid synthesis, (in brief)	1
	Ketone body formation and utilization	1
	Outlines of cholesterol synthesis and compounds formed from cholesterol	1
	Plasma lipoproteins: Formation, function and dyslipidemia, Atherosclerosis.	2
3	**ENZYMES**	**6 hours**
	Definition, classification, specificity and active site. Cofactors.	1
	Factors affecting enzyme action	2
	Enzyme inhibition	2
	Clinical important enzymes- AST,ALT,ALP,PSA,LDH,CK,G6PD,GGT	1
4	**PROTEINS**	**9hours**
	Amino acids: Classification. Introduction to peptides, peptide bond Proteins: Classification. Charge properties. Buffer action. Levels of protein organization Denaturation.	3
	Digestion and absorption of proteins. Nitrogen balance. Essential amino acids. Protein quality and requirement (methods for	2

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	evaluation of protein quality to be excluded). Protein-calorie malnutrition, Balanced diet.(*in brief*)	
	Formation of Ammonia and Urea cycle.	1
	Reactions of amino acids-transamination, trans methylation, trans sulfuration (*in brief*)	1
	Compounds formed from glycine	1
	Biologic importance of aromatic amino acids, sulphur containing amino acids, Aminoacidurias (in brief)	1
5	**INTEGRATION OF METABOLISM** High energy compounds, Electron transport chain and oxidative phosphorylation.	**2hours**
6	**VITAMINS**	**5 hours**
	Fat soluble vitamins A,D,E,K, sources, functions, daily requirements, deficiency, Toxicity	2
	Water soluble vitamins B, C, sources, functions, daily requirements, deficiency, Toxicity	3
7	**ACID BASE BALANCE** Buffers, respiratory and renal regulation, disorders, analysis	**4hours**
8	**MINERALS**	**6hours**
	Classification, daily requirement. Calcium and phosphorous: sources, uptake, excretion, function. Serum calcium regulation.	2
	Iron: sources, uptake and transport. Heme and nonheme iron functions; deficiency	2
	Iodine: Brief introduction to thyroxine synthesis. General functions of thyroxine. Fluoride: function, deficiency and excess	1
	Indications of role of other minerals	1
9	**HAEMOGLOBIN**	**3 hours**
	Structure, synthesis, degradation	1
	Hemoglobinopathies	1
	Jaundice	1
10	**PLASMA PROTEINS** Classification and separation. Functions of albumin.	**2 hours**

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	immunoglobulins. Biochemistry of AIDS.	
11	**LIVER FUNCTION TESTS**	**1 hours**
12	**KIDNEY FUNCTION TESTS**	**1 hours**
13	**MOLECULAR BIOLOGY**	**8 hours**
	Nucleic acids: Building units. Nucleotides. Outline structure of DNA and RNA.	2
	Formation and degradation of nucleotides. (*in brief*) Gout. Lesch-nyhan syndrome	2
	Replication. Transcription. (*in brief*) Antimetabolites and antibiotics interfering in replication, transcription	2
	Outline of translation process.	2
14	**Techniques-colorimetry, ELISA, RIA**	**2 hours**

c) PRACTICALS,DEMONSTRATION& SEMINAR: 60 hours

i. Practical: 45 hours

Sl.No.	Procedure	Hours
1.	Introduction to lab procedures	1
2.	Normal & abnormal constituents of urine	12
3.	Introduction to clinical chemistry	2
4.	Estimation of blood urea	2
5.	Estimation of serum protein	2
6.	Estimation of blood sugar	2
7.	Estimation of serum creatinine	2
8	Estimation of serum albumin	2

ii. Demonstration: 20 hours

Sl.No.	Procedure	Hours
1.	Electrophoresis	2
2.	Chromatography	2
3.	GTT charts	2
4.	LFT charts	2
5.	Revision	3

iii. Seminars: 15 hours

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d) SCHEMEOF EXAMINATION

Types of Questions for written examination

Type of Questions	Marks
Structured Essays 1x 10 marks	10
Short Notes 2 x 5 marks	10
Brief Notes 5 x 3 marks	15
Total	**35**

i. ***Theory:***

University written Examination: **35Marks**
University Viva: **10Marks**
Internal Assessment: **5 Marks**
Total: 50 Marks

ii. ***Practicals:***

Internal Assessment: **10 Marks**
University Practicals: **40Marks**
Total: 50 Marks
Grand Total 100Marks

Mark distribution for University practical examination;

One procedure for quantitative estimation	15marks
One procedure for qualitative analysis	20marks
Practical Work record:	5 Marks

The following Procedures are suggested for University Practical Examination:

Quantitative Estimation (Any ONE estimation to be done)

Estimation of blood sugar/serum creatinine/blood urea/serum protein/serum albumin

Qualitative Analysis (Any ONE analysis to be done)

Urine Analysis–normal constituents

Report of abnormal urine

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4. DENTAL ANATOMY, EMBRYOLOGY AND ORAL HISTOLOGY.

a) INTRODUCTION:

The course includes instructions in the subject of Dental Morphology, Oral Embryology, Oral Histology and Oral Physiology. A composite study of basic Dental Sciences & their clinical applications.

b) SKILLS

The student should acquire basic skills in:

i. Carving of crowns of permanent teeth in wax.
ii. Microscopic study of Oral tissues.
iii. Identification of Deciduous & Permanent teeth
iv. Age estimation by patterns of teeth eruption from plaster casts of different age groups.

c) OBJECTIVES

After a course on Oral Biology,

i. The student is expected to appreciate the normal development, morphology, structure & functions of oral tissues & variations in different pathological/non-pathological states.
ii. The student should understand the histological basis of various dental treatment procedures and physiologic ageing process in the dental tissues.
iii. The students must know the basic knowledge of various research methodologies

d) COURSE CONTENT

i. Theory: 105 hours

DENTAL ANATOMY	HOURS
1. Introduction, Dental Anthropology & Comparative Dental Anatomy	**3**
2. Function of teeth.	
3. Nomenclature.	
4. Tooth numbering systems (Different system)(Dental formula).	
5. Chronology of deciduous and permanent teeth. (First evidence of calcification, crown completion, eruption and root completion).	**2**
6. Deciduous teeth - a) Nomenclature. b) Importance of deciduous teeth. c) Form & function, comparative dental anatomy, fundamental curvature	**4**
7. Gross morphology of deciduous teeth.	**5**
8. General differences between deciduous and permanent teeth.	**1**
9. Morphology of permanent teeth. Chronology, measurements, description of individual surface and	**12**

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variations of each tooth.	
10. Morphological differences between incisors, premolars and molars of same arch.	**1**
11. Morphological differences between maxillary and mandibular. incisors, canines, premolars and molars of the opposite arch	**1**
12. Internal Anatomy of Pulp.	**1**
13. Occlusion: a. Development of occlusion. b. Dental arch form. c. Compensating curves of dental arches. d. Angulations of individual teeth in relation to various planes. e. Functional form of the teeth at their incisal and occlusal thirds. f. Facial relations of each tooth in one arch to its antagonist or antagonists in the opposing arch in centric occlusion. g. Occlusal contact and interscusp relations of all the teeth of one arch with those in the opposing arch in centric occlusion. h. Occlusal contact and intercusp relations of all the teeth during the various functional mandibular movements. i. Neurobehavioral aspect of occlusion	**8**
14. Temporo Mandibular Joint (T.M.J.): Gross Anatomy and articulation.Muscles (Muscles of mastication). Mandibular position and movements.Histology. Clinical considerations with special emphasis on Myofacial Pain Dysfunction Syndrome (MPDS) - (Desirable to Know)	**2**
ORAL PHYSIOLOGY	
1. Theories of calcification	**1**
2. Mastication and deglutition	**1**
Oral Embryology, Anatomy and Histology:	
1. Development and growth of face and jaws.	**1**
2. Development of tooth.	**3**
3. Cranial nerves with more emphasis on V.VII and IX.	**1**
4. Blood supply, nerve supply and lymphatic drainage of teeth and surrounding structures	**1**
5. Cell - structure and function	**1**

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6. Maxillary sinus - Structure, Variations, Histology function and clinical considerations	**2**
7. Salivary Glands - Classification, structure, function, Histology, Clinical Considerations and age changes.	**4**
8. Oral Mucous membrane: Definitions, General consideration. Functions and classifications. Structure and microscopic appearance of gingiva, palate, lips, alveolar mucosa, tongue, floor of mouth. Gingival sulcus and dentogingival junction. Clinical considerations and age changes.	**8**
9.ENAMEL: Physical characteristics, chemical properties structure. Development - Life cycle of ameloblasts, Amelogenesis and Mineralisation. Clinical considerations. Age changes.	**8**
10.DENTIN: Physical characteristics, chemical properties, structure. Types of dentin. Dentin innervation and hypersensitivity. Development - Dentinogenesis and mineralisation. Clinical considerations. Age Changes.	**6**
11.PULP: Anatomy, structural features, functions, pulp organs. Developments. Clinical consideration Age changes.	**6**
12.CEMENIUM: Physical characteristics, chemical properties, structure. Cementogenesis. Clinical consideration Age changes.	**4**
13.PERIODONTAL LIGAMENT: Cells and fibers, Functions, Development, Clinical Considerations., Age Changes	**5**
14.ALVEOLAR BONE: Physical characteristics, chemical properties structure. Structure, Development., Internal reconstruction, Clinical consideration.	**5**
Tissue processing & Histochemistry	**4**
THEORIES OF ERUPTION AND SHEDDING. (Physiological tooth movement)	**4**

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ii. Practical: 250 Hours

DENTAL ANATOMY: Carving on wax blocks:- a. Individual tooth - Only permanent teeth of both arches. - Central, Incisors, Lateral, Canines, Premolars and 1st and 2nd molars
HISTOLOGY: List of Histology slides: **Development of tooth:** 01. Bud stage of tooth development. 02. Cap stage of tooth development. 03. Early bell stage of tooth development. 04. Late Bell stage of tooth development. 05. Root formation. **ENAMEL:** 01. Enamel rod. 02. Hunter-Schreger Bands 03. Tufts, Lamellae, Spindles. 04. Incremental lines of Retzius. 05. Neonatal line. 06. Gnarled Enamel. **DENTIN:** 01. Dentino - Enamel junction. 02. Dentinal Tubules. 03. Incremental lines of Von Ebner. 04. Contour lines of Owen. 05. Neonatal line. 06. Tomes granular layer. 07. Interglobular Dentin. 08. Secondary Dentin. 09. Intratubular Dentin. 10. Intertubular Dentin. **CEMENTUM:** 01. Cellular cementum.

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02. Acellular cementum.

03. Cemento enamel junction

- Type 1 - 60% type - Overlapping.

- Type 2 - 30% type - Butt

- Type 3 - 10% type - Cementum & Enamel do not meet.

04. Sharpey's fibers.

05. Hypercementosis.

PULP:

01. Zones of Pulp.

02. Pulp stones.

PERIODONTAL LIGAMENT:

01. Principle fibers of Periodontal ligament

- Apical, Horizontal, Oblique, Alveolar crest, Interradicular, Transeptal

ALVEOLAR BONE:

01. Haversian system.

02. Trabeculated bone.

03. Mature and immature bone.

SALIVARY GLANDS:

01. Mucous gland.

02. Serous gland.

03. Mixed gland.

MAXILLARY SINUS:

Sinus lining (Pseudostratified ciliated columnar)
(Desirable to know)

ORAL MUCOUS MEMBRAIN:

01. Parakeratinised epithelium.

02. Orthokeratinised epithelium.

03. Palate - Anterolateral zone.

04. Palate - Posterolateral zone.

05. Alveolar mucosa.

06. Vermilion border of lip.

07. Tongue - Circumvallate Papillae.
- Fungiform Papillae
- Filiform Papillae

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Preparation of Ground sections, haematoxylin & Eosin sections & decalcified section

iii. Lecture demonstration:

Identification of Individual teeth

(1) Deciduous

(2) Permanent

(3) Mixed dentition using study models

(4) Demonstration of preparation of ground section, Decalcification, Paraffin section and H & E Staining.

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e) SCHEME OF EXAMINATION

Distribution of Topics and Type of Questions for University written examination

Contents	Type of Questions and Marks	Marks
Dental anatomy - one question - 14 marks Detailed morphology of Permanent teeth, Differences between Primary & Permanent teeth, Occlusion and Arrangement of teeth. **B. Oral histology - one question - 14 marks** Development of tooth, Enamel-structure & development, Dentin-structure& development, Cementum, Dental pulp-structure & histology, Periodontal ligament, Alveolar bone-structure & histology, Oral mucosa-structure & histology, Eruption of teeth	Structured Essays 2x 10marks	20
A. Oral histology - two questions - 16 marks B. Dental anatomy - one question - 08 marks C. Oral physiology - one question - 08 marks	Short notes 4 x 5marks	20
A. Oral histology - five questions - 20 marks B. Dental anatomy - three question - 12 marks C. Oral physiology - one question - 04 marks D. Oral embryology - one question - 04 marks	Brief Notes 10x3marks	30
	Total	**70**

i. Theory

University written Examination: **70Marks**

University Viva: **20Marks**

Internal Assessment: **10 Marks**

ii. Practicals:

Internal Assessment: **20 Marks**

University Practicals: **80Marks**

Grand Total **200 Marks**

Mark Distribution for University Practical Examination:

Tooth Carving: (Time allotted 75 Minutes) 25 Marks

Spotters: (15X3 marks) 45 Marks

Practical work Record: 10 marks

Type of Spotters:

8 Histology and Ground Section slides

5 Tooth identification

2 Casts for identification of teeth, numbering system and age assessment

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5. GENERAL PATHOLOGY

a) AIM:

At the end of the course the student should be competent to: Apply the scientific study of disease processes, which result in morphological and functional alterations in cells, tissues and organs to the study of pathology and the practice of dentistry.

b) OBJECTIVES:

Enabling the student

i. To demonstrate and analyze pathological changes macroscopically explain their observations in terms of disease processes.

ii. To integrate knowledge from the basic sciences, clinical medicine and dentistry in the study of Pathology.

iii. To demonstrate understanding of the capabilities and limitations of morphological Pathology in its contribution to medicine, dentistry and biological research.

iv. To demonstrate ability to consult resource materials outside lectures, laboratory and tutorial classes.

c) COURSE CONTENT:

i. Theory: 55Hours

Sl. No.	TOPIC	HOURS ALLOTTED
1	Introduction , Terminologies, The cell in health, The normal cell structure, The cellular functions	1
2	Etiology and Pathogenesis of disease, Cell Injury Types - congenital, Acquired Mainly Acquired causes (Hypoxic injury, chemical injury, physical injury, immunological injury) Cell death& Necrosis Apoptosis, definition, causes, features and types of necrosis Gangrene - Dry, wet, gas Pathological Calcifications (Dystrophic and metastatic)	3
3	Degenerations, Amyloidosis, Fatty change, Cloudy swelling, Hyaline change, mucoid degeneration	2
4	Inflammation, Definition, causes types, and features, Acute inflammation, The vascular response, The cellular response, Chemical mediators, The inflammatory cells Fate, Chronic inflammation, Granulomatous inflammation	3

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5	Healing Regeneration, Repair Mechanisms, Healing by primary intention, Healing by secondary intention, Fracture healing, Factors influencing healing process, Complications	3
6	Immunological mechanisms in disease Humoral & cellular immunity Hypersensitivity & autoimmunity	2
7	Infections & infestations (1) Syphilis: Epidemiology, Types and stages of syphilis, Pathological, features, Diagnostic criteria, Oral lesions (2) Typhoid, Epidemiology, Pathogenesis, Pathological features, Diagnostic criteria, Thrombosis (3) Tuberculosis, Epidemiology, Pathogenesis, (Formation of tubercle), Pathological, features of Primary and secondary TB, Complications and Fate (4) AIDS & Hepatitis (5) Actinomycosis (6) Candidiasis (7) Mucormycosis (8) Pyogenic infections	6
8	(1) Disorders of circulation, Hyperemia, Shock (2) Definition, Pathophysiology, Formation, complications & Fate of a thrombus (3) Embolism, Definition, Types, Effects (4) Ischemia and Infarction, Definition, etiology, types, Infraction of various organs (5) Derangements of body fluids, Oedema - Pathogenesis, Different types	4
9	Nutritional Disorders, starvation, obesity, malnutrition, pathogenesis of deficiency diseases with special reference to disorders of vitamins & minerals	3
10	Diabetes Mellitus, Definition, Classification, Pathogenesis, Pathology in different organs	2
11	Hypertension, Definition, classification, Pathophysiology, Effects in various organs	2
12	Brief introduction to growth & differentiation Adaptive disorders of	1

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	growth, Atrophy & Hypertrophy, Hyperplasia, Metaplasia and Dysplasia	
13	General Aspects of neoplasia, Definition, terminology, classification, Differences between benign and malignant neoplasms, The neoplastic cell, Metastasis, Etiology and pathogenesis of neoplasia, Carcinogenesis, Tumour biology, Oncogene and anti-oncogenes, Diagnosis, Precancerous lesions, Common specific tumours, Sq papilloma & Ca, Basal cell Ca, Adenoma & Adenocarcinoma, Fibroma & Fibrosarcoma, Lipoma and liposarcoma	4
14	Common diseases of Bones, Osteomyelitis, Metabolic bone diseases, Bone Tumours, Osteosarcoma, Osteocalstoma, Giant cell Tumour, Ewing's sarcoma, Fibrous dysplasia, Aneurismal bone cyst	3
15	Diseases of oral cavity, Lichen planus, Stomatitis, Leukoplakia, Squamous cell Ca, Dental caries, Dentigerious cyst, Ameloblastoma Diseases of salivary glands, Normal structure, Sialadenitis & Tumours	4
16	Diseases of Cardiovascular system Cardiac failure, Congenital heart disease ASD, VSD, PDA, Fallot's Tetrology, Infective Endocarditis, Atherosclerosis, Ischaemic heart Disease	2
17	Introduction to haematology , haemopoiesis, bone marrow aspiration & biopsy, Anaemias, classification, Iron Deficiency anaemia, Megaloblastic anaemia, hemolytic anaemeas and their lab investigations, Polycythemea.	3
18	Haemorrhagic Disorders, Coagulation cascade Coagulation disorders Platelet function, Platelet disorders	3
19	Diseases of WBC's pathologic variations in white blood cell counts and leukemoid reactions, Leukaemias, Acute and chronic leukaemias, Diagnosis and clinical features Diseases of Lymph nodes, Hodgkin's disease, Non Hodgkins lymphoma, Metastatic carcinoma	4

ii. Practicals and lecture demonstrations: 55 hours

(1) Lecture demonstrations: 10 Hours

a) Anti coagulants, Blood indices

b) PCV & ESR

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c) Instruments & their uses:

(i) Neubauer's Counting chamber

(ii) Haemoglobinometer

(iii) W.B.C Pipette

(iv) Wintrobe Tube

(v) Urinometer

d) Cytologic Techniques- FNAC and buccal smear

e) Study of anaemeas- Microcytic, Macrocytic and Dimorphic blood picture

f) Study of Acute leukemias- Any one type

g) Study of Chronic Leukemias- Any one type

(2) Histopathology Slides & Specimens: 20 Hours

a) Tissue Processing, Staining

b) Histopathology slides

(i) Acute appendicitis,

(ii) Granulation tissue,

(iii) fatty liver

(iv) CVC lung, CVC liver, CVC spleen

(v) Kidney amyloidosis

(vi) Tuberculosis,

(vii) Actionomycosis,

(viii) Rhinosporidiosis

(ix) Squamous cell papilloma,

(x) Transitional cell papilloma,

(xi) Pleomorphic adenoma

(xii) Basal cell carcinomas

(xiii) Sqamous cell carcinoma

(xiv) Osteosarcoma,

(xv) osteoclastoma,

(xvi) fibrosarcoma

(xvii) Malignant melanoma,

(xviii) Ameloblastoma,

(xix) Adenocarcinoma

(xx) Pleomorphic adenoma

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(xxi) Metastatic carcinoma in lymph node

(xxii) Capillary and cavernous haemangioma

(xxiii) Fibroma

(xxiv) Neurofibroma

(xxv) Lipoma

(xxvi) Osteoma, chondroma

c) Specimens

(i) Acute Appendicitis.

(ii) Tuberculosis Lymphnode.

(iii) Fatty liver.

(iv) Infarction spleen.

(v) Chronic Venous Congestion (C.V.C.) Liver

(vi) Squamous papilloma

(vii) Basal cell carcinoma

(viii) Lipoma

(ix) Squamous cell carcinoma

(x) Malignant Melanoma

(xi) Adenocarcinoma

(xii) Osteosarcoma

(xiii) Osteoclastoma.

(xiv) Gangrene.

(3) **Practicals that must be done by the students: 25hrs.**

(i) Determination of Haemoglobin percentage

(ii) Blood grouping.

(iii) Total Leukocytecount

(iv) Bleeding time , Clotting time

(v) Peripheral blood smear staining and study

(vi) Differential leukocyte count.

(vii) Urine examination- for sugar, ketone bodies, protein, blood, bile pigments and bile salts- any one standard test

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d) SCHEME OF EXAMINATION

i. Theory:

Distribution of Topics and Type of Questions for written examination

Contents	Types of Questions and Marks	Marks
Question from General Pathology Inflammation, Healing and Repair, Tuberculosis, Leprosy, Syphilis, Thrombosis, Neoplasia, Diseases of bone, Cell injury, metabolic disturbances, Circulatory disturbances, Hypertension, diseases of oral cavity	Structured Essay 1x 10marks	10
Two questions from General Pathology Intracellular accumulations, Necrosis, Gangrene, Apoptosis, Amyloidosis, Pathologic calcification, hypersensitivity reactions, Infections, Shock, Oedema, Infarction, Congestion, Hypertension, Diabetes Mellitus, Premalignant Conditions, Neoplasia, Osteomyelitis, Anaemias, Neoplastic Proliferation of WBCs–Leukaemias and Lymphomas, Haemorrhagic disorders, Erythrocyte Sedimentation Rate(ESR),Urine sediment. Two from Haematology One from Clinical Pathology	Short Notes 2 x 5marks Brief notes 5 x 3	10 15
	Total	**35**

i. ***Theory:***

University written Examination: **35Marks**
University Viva: **10Marks**
Internal Assessment: **5 Marks**
Total: 50 Marks

ii. ***Practicals:***

Internal Assessment: **10 Marks**
University Practicals: **40Marks**
Total: 50 Marks
Grand Total 100Marks

Mark distribution for University practical examination

Spotters

Haematology slide	2x 2marks
Histopathology slides	5x2marks
Specimens	2x2marks
Instruments	1x2marks

Any three of the following exercises to be evaluated:

To examine given sample of urine for abnormal constituents
To do differential count on the given peripheral blood smear
To estimate haemoglobin percentage in the given sample of blood
To determine blood groups (ABO and Rh) in the given sample of blood
} 3x 5 marks

Practical work record 5marks

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6 GENERAL MICROBIOLOGY

a) AIMS:

Introduce the students to the exciting world of microbes. To make the students aware of various branches of microbiology and the role of microbes in human diseases. The objectives of teaching microbiology can be achieved by various teaching techniques such as:

Lectures

Lecture Demonstrations

Practical exercises

Audio visual aids

Small group discussions with regular feedback from the students to be arranged.

b) OBJECTIVES:

i. Knowledge and Understanding

At the end of the Microbiology course the student is expected to:

(1) Understand the basics of various branches of microbiology and able to apply the knowledge relevantly.

(2) Apply the knowledge gained in related medical subjects like General Medicine and General Surgery and Dental subjects like Oral Pathology, Public Health Dentistry, Periodontics, Oral Surgery, Pedodontics, Conservative Dentistry and Oral medicine in higher classes.

(3) Understand and practice various methods of Sterilisation and disinfection in dental clinics.

(4) Have a sound understanding of various infectious diseases and lesions in the oral cavity.

ii. Skills

(1) Student should have acquired the skill to diagnose, differentiate various oral lesions.

(2) Should be able to select, collect and transport clinical specimens to the laboratory.

(3) Should be able to carry out proper aseptic procedures in the dental clinic.

c) COURSE CONTENT:

A brief syllabus of Microbiology is given as follows:

i. General microbiology:

(1) History, Introduction, Scope, Aims and Objectives.

(2) Morphology and Physiology of bacteria.

(3) Detail account of Sterlisation and Disinfection.

(4) Brief account of Culture media and Culture techniques.

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(5) Basic knowledge of selection, collection, transport, processing of clinical specimens and identification of bacteria.

(6) Bacterial Genetics and Drug Resistance in bacteria.

ii. Immunology:

(1) Infection - Definition, Classification, Source, Mode of transmission and types of Infectious disease.

(2) Immunity

(3) Structure and functions of Immune system

(4) The Complement System

(5) Antigen

(6) Immunoglobulins - Antibodies - General structure and the role played in defense mechanism of the body.

(7) Immune response

(8) Antigen - Antibody reactions - with reference to clinical utility.

(9) Immuno deficiency disorders - a brief knowledge of various types of immuno deficiency disorders - A sound knowledge of immuno deficiency disorders relevant to dentistry.

(10) Hypersensitivity reactions

(11) Autoimmune disorders - Basic knowledge of various types - sound knowledge of autoimmune disorders of oral cavity and related structures.

(12) Immunology of Transplantation and Malignancy

(13) Immune haematology

iii. Systematic bacteriology:

(1) Pyogenic cocci - Staphylococcus, Streptococcus, Pneumococcus, Gonococcus and Meningococcus - brief account of each coccus - detailed account of mode of spread laboratory diagnosis, Chemo therapy and prevention.

(2) Detailed account of Cariogenic Streptococci

(3) Corynebacterium diphtheriae - mode of spread, important clinical feature, Laboratory diagnosis, Chemotherapy and Active immunisation.

(4) Mycobacteria - Tuberculosis and Leprosy

(5) Clostridium - Gas gangrene, food poisoning and tetanus.

(6) Non-sporing Anaerobes - in brief about classification and morphology, in detail about dental pathogens - mechanism of disease production and prevention.

(7) Spirochaetes - Treponema pallidum - detailed account of Oral Lesions of syphilis, Borrelia vincentii, Actinomycetes.

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iv. Virology:

(1) Introduction

(2) General properties, cultivation, host - virus interaction with special reference to Interferon.

(3) Brief account of Laboratory diagnosis, Chemotherapy and immuno prophylaxis in general.

(4) A few viruses of relevance to dentistry.

a) Herpes Virus

b) Hepatitis B Virus - brief about other types

c) Human Immunodeficiency Virus (HIV)

d) Mumps Virus

e) Brief- Measles and Rubella Virus

(5) Bacteriophage - structure and Significance

v. Mycology:

(1) Brief Introduction

(2) Candidosis - in detail

(3) Briefly on oral lesions of systemic mycoses.

vi. Parasitology:

(1) Brief introduction - protozoans and helminthes

(2) Brief knowledge about the mode of transmission and prevention of commonly seen parasitic infection in the region.

d) Theory: 65 Hours

Topics		Hours
I.GENERALBACTERIOLOGY		
1.	Introduction, History and classification.	02
2.	Morphology, Physiology of Bacterial cell.	02
3.	Bacterial Genetics	02
4.	Infection	02
II.IMMUNOLOGY		
1.	Immunity	02
2.	Antigen	01
3.	Antibodies	01
4.	Structures and functions of Immune system	01
5.	Immune response	01
6.	Antigen and antigen reactions &compliment	04
7.	Hypersensitivity	02
8.	Autoimmunity	01

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9.	Immunology of transplantation	01
III.SYSTEMATICBACTERIOLOGY		
1.	Staphylococci	01
2.	Streptococci (Dental Caries)	02
3.	Pneumococci	01
4.	Meningococci &Gonococci	01
5.	Corynebacterium diphtheria	02
6.	Bacillus	01
7.	Clostridia	02
8.	Non sporing Anaerobes	02
9.	Mycobacteria	03
10.	Spirochaetes (Treponema, leptospira and Borrelia)	03
11.	Normal bacterial flora of the Oral Cavity	01
IV.VIROLOGY		
1.	General properties of viruses	03
2.	Herpes viruses	02
3.	Measles and Mumps	01
4.	Rabies virus.	01
5.	Hepatitis viruses	02
6.	Human Immunodeficiency Virus(HIV)	01
7.	Oncogenic viruses &Poliomyelitis	02
V. PARASITOLOGY		
1.	Introduction to parasitic diseases	01
2.	Entamoeba histolytica, Malaria, Leishmania	03
VI. MYCOLOGY		
1.	Candidiasis (in detail)	02
2.	Rhinosporidiosis	02
VII.APPLIEDMICROBIOLOGY		
1.	Immunisation schedule, Collection of materials, Experimental animals &hospital infections – in brief	02

vii. Practicals/Demonstrations: 50 Hours

(1) Demonstrations:

a) Morphological forms of microbes

b) Different morphological forms of bacteria, viruses, fungi, parasites.

c) Sterilization Methods – Specified techniques – their uses.

d) Culture Media – transport media

e) Special staining techniques, stained preparations – dark ground microscopy.

f) Demonstration of bacteria in stained clinical material.

g) Demonstration of viruses – Permanent preparations morphology, inclusion bodies.

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h) Demonstration of parasite – in blood smear – in stool – in urine.

i) Demonstration of common fungi – candida – Dermatophytes.

(2) Practicals:

a) Simple staining of bacteria

b) Gram's staining – isolated bacteria – Clinical materials.

c) Ziehl-Neelsen staining – prepared and fixed smears.

d) Collection of materials for culture – pus, blood.

(3) List of practical materials slides f*or demonstration:*

a) Staphylococcus

b) Streptococcus

c) Gonococcus

d) Pneumococcus

e) Mycobacterium Tuberculosis

f) Mycobacterium leprae

g) Anthrax

h) Cl. Tetani

i) Spirochaetes

j) Gram Negative Bacilli

k) Candida

l) Actinomyces

(4) **Slides for practical exercises:**

a) Grams stains

(i) Staphylococci

(ii) Gram negative bacilli

(iii) Mixture of any two organisms

(iv) Gram stain of the oral cavity

b) Albertsstain–Kleb's Loffeler's Bacilli(KLB)culture, slide

c) Ziehl-Neelson'sstain -Sputum positive for AFB

(5) **Media for demonstration:**

i. Un-inoculated media:

(i) Nutrient agar plate

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(ii) Blood agar plate

(iii) Chocolate agar plate

(iv) Macconkey agar plate

(v) Glucosecitrate broth(Blood culture bottle)

(vi) Lowenstein Johnson's Mediaslope

(vii) Loefflers serum slope

(viii) Sabourauds slope

(ix) Milk agar plate

(x) Robert Cooked Meat broth

ii. Inoculated media:

(i) Nutrient agar with staphylococci

(ii) Blood Agar with Alpha Haemolytic Streptococci

(iii) Blood Agar withBeta Haemolytic Streptococci

(iv) Potassium Tellurite with growth of C.diphtheriae

(v) Milk agar with staphylococci

(vi) Antibiotic sensitivity plate

iii. Animals:

(i) Guinea pig

(ii) Rabbit

(iii) Mice

iv. Instruments:

(i) VDRL slide

(ii) Tuberculin syringe

(iii) Sterile swab

(iv) Seitz filter

(v) MacIntosh Fildes jar

(vi) Widal rack with tubes

(vii) Microtitre plate

(viii) Disposable syringe

(ix) Surgical gloves

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e) SCHEME OF EXAMINATION

i. Theory

Distribution of Topics and Type of Questions for University written examination:

Contents	Type of Questions and Marks	Marks
One Long Essay question from Systematic Bacteriology	Structured Essay 1 x 10marks	10
One question from General bacteriology One question from Immunology One question from Mycology One question from Parasitology / Oral Microbiology One question from Systematic Bacteriology	Short notes 2 x 5marks	10
One question from General bacteriology One question from Immunology One question from Systematic Bacteriology Two questions fromVirology	Brief Notes 5x3marks	15
	Total	**35**

iii. *Theory:*

University written Examination: **35Marks**
University Viva: **10Marks**
Internal Assessment: **5 Marks**
Total: 50 Marks

iv. Practicals:

Internal Assessment: **10 Marks**
University Practicals: **40Marks**
Total: 50 Marks
Grand Total 100Marks

Mark distribution for University practical examination

Spotters

Slides	5x 2 Marks
Media	3x2 Marks
Instruments	2x2 Marks
Gram's Stain	7 Marks
Ziehl-Neelsen's Stain	8 Marks
Practical work record	5 Marks

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7 DENTAL MATERIALS

a) INTRODUCTION:

The science of Dental Material has undergone tremendous changes over the years. Continued research has led to new material systems and changing concepts in the dental field. Interlinked with various specialized branches of chemistry, practically all engineering applied sciences and biological characteristics, the science of dental material emerged as basic sciences in itself with its own values and principles.

b) AIMS:

Aim of the course is to present basic chemical and physical properties of Dental materials as they are related to its manipulation to give a sound educational background so that the practice of the dentistry emerged from art to empirical status of science as more information through further research becomes available. It is also the aim of the course of Dental materials to provide with certain criteria of selection and which will enable to discriminate between facts and propaganda with regards to claims of manufactures.

c) OBJECTIVES:

To understand the evolution and development of science of dental materials. Impart knowledge of physical and chemical properties and advantages and disadvantages of various materials used in dentistry. Acquire knowledge of biomechanical requirements of particular restorative material and its application & limitations. Laying down standards or specifications of various materials to guide to manufacturers as well as to help professionals. Search for newer and better materials which may answer our requirements with greater satisfaction. To understand and evaluate the claims made by manufactures of dental materials.

At the end of the course the student should have the knowledge about the composition, properties, manipulative techniques and their various commercial names. The student should also acquire skills to select and use the materials appropriately for laboratory and clinical use.

d) NEED FOR THE COURSE:

The profession has to raise from an art to a science, the need for the dentist to possess adequate knowledge of materials to exercises his best through knowledge of properties of different types of materials. There is growing concern of health hazards due to mercury toxicity, inhalation of certain vapors or dust materials, irritations and allergic reaction to skin due to contact of materials. The Dentist must acquire wider knowledge of physical, chemical and biological properties of the various materials used in the mouth because they may cause irritation of oral tissues. pH of some of the restorative materials causes inflammation and

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necrosis of pulp which is a concern and the patient should be protected from these. Certain criteria of selection are provided that will enable the dentist to discriminate between facts and propaganda, which will make a material biologically acceptable.

e) SCOPE:

Dental materials are employed in mechanical procedures including restorative dentistry such as Prosthodontics, Endodontics, Periodontics and Orthodontics. There is scarcely a dental procedure that does not make use of dental materials in one form or another and therefore the application of dental material is not limited to any one branch of dentistry. Branches such as minor surgery and Periodontics require less use of materials but the physical and chemical characters of materials are important in these fields. The toxic and tissue reaction of dental materials and their durability in the oral cavity where the temperature is between 32 & 37 degree centigrade, and the ingestion of hot or cold food ranges from 0-70 degree centigrade. The acid an alkalinity of fluids shown pH varies from 4 to 8.5. The load on 1 sq. mm of tooth or restorative materials can reach to a level as high as many kilograms. Thus the biological properties of dental materials cannot be separated from their physical and chemical properties.

f) THEORY: 80 HOURS (20 hours in First BDS & 60 hours in second BDS)

Section A- Prosthodontics, Section B- Conservative Dentistry

Sl. No	Topic	Hours
1.	**Introduction - Section A Prosthodontics & Section B Conservative Dentistry**	**2**
2.	Structure of matter and principles of adhesion- Section A Change of state, inter atomic primary bonds, inter atomic secondary bonds, inter atomic bond distance and bonding energy, thermal energy, crystalline structure, non crystalline structures, diffusion, adhesion and bonding and adhesion to tooth structures.	**2**
3.	**Important physical properties applicable to dental materials - Section B** Physical properties are based on laws of mechanics, acoustics, optics, thermodynamics, electricity, magnetism, radiation, atomic structure or nuclear phenomena. Hue, value, chroma and translucency physical properties based on laws of optics, dealing with phenomena of light, vision and sight. Thermal conductivity & coefficient of thermal expansion are physical properties based on laws of thermodynamics. Stress, strain, proportional limit, elastic limit yield strength, modulus of elasticity, flexibility, resilience, impact, impact strength, permanent deformation, strength, flexure strength fatigue, static fatigue, toughness, brittleness, ductility & malleability, hardness, abrasion	**6**

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	resistance, relaxation, rheology, Thixotropic, creep, static creep, dynamic creep, flow, colour, three dimensional colour - hue, values, chroma, Munsell system, metamersim, fluorescence, physical properties of tooth, stress during mastication.	
4.	**Biological considerations in use of dental materials- Section B** Materials used are with the knowledge of appreciation of certain biological considerations for use in oral cavity. Requirement of materials with biological compatibility. Classification of materials from perspective of biological compatibility, eg. Contact with soft tissues, affecting vitality of pulp, used for root canal fillings, affecting hard tissues of teeth, laboratory materials that could be accidentally be inhaled or ingested during handling. Hazards associated with materials: pH-effecting pulp, polymers causing chemical irritation, mercury toxicity, etc. Microleakage, Thermal changes, Galvanism, toxic effect of materials. Biological evaluation for systemic toxicity, skin irritation, mutagenecity and carcinogenicity. Disinfection of dental materials for infection control.	**2**
5.	**Gypsum & gypsum products- Section A** Gypsum - its origin, chemical formula, Products manufactured from gypsum. Dental plaster, Dental stone, Die stone, high strength, high expansion stone. Application and manufacturing procedure of each, macroscopic and microscopic structure of each. Supplied as and Commercial names. Chemistry of setting, setting reaction, theories of setting, gauging water, Microscopic structure of set material. Setting time: working time and setting time, Measurement of setting time and factors controlling setting time. Setting expansion, Hygroscopic setting expansion - factors affecting each. Strength: wet strength, dry strength, factors affecting strength, tensile strength Slurry - need and use. Care of cast. ADA classification of gypsum products Description of impression plaster and dental investment Manipulation including recent methods or advanced methods. Disinfection: infection control, liquids, sprays, radiation Method of use of disinfectants Storage of material - shelf life.	**4**
6.	**Impression materials used in dentistry- Section A** Impression plaster, Impression compound, Zinc oxide Euginol impression paste & bite registration paste incl., non Euginol paste, Hydrocolloids, reversible and irreversible, Elastomeric impression materials. Polysulphide, Condensation silicones, Addition silicones, Polyether, Visible light cure polyether urethane dimethacrylate. Historical background & development of each impression material, Definition of impression, Purpose of making impression, Ideal properties required and application of material.	**10**

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	Classification as per ADA specification, general & individual impression material. Application and their uses in different disciplines. Marketed as and their commercial names, Mode of supply & mode of application bulk/wash impression. Composition, chemistry of setting, Control of setting time, Type of impression trays required, Adhesion to tray, manipulation, instruments & equipments required. Techniques of impression, storage of impression, (Compatibility with cast and die material). Any recent advancement in material and mixing devices. Study of properties: Working time, setting time, flow, accuracy, strength, flexibility, tear strength, dimensional stability, and compatibility with cast & die materials incl., electroplating Biological properties: tissue reaction, Shelf life & storage of material. Infection control - disinfection Advantages & disadvantages of each material.	
7.	**Synthetic resins used in dentistry - Section A** Historical background and development of material, Denture base materials and their classification and requirement. Classification of resins, Dental resins - requirements of dental resins, applications, polymerisation, polymerisation mechanism stages in addition polymerisation, inhibition of polymerisation, co-polymerization, molecular weight, crosslinking, plasticizers, Physical properties of polymers, polymer structures types of resins.	**3**
	Acrylic resins: - Section A Mode of polymerisation: Heat activated, Chemically activated, Light activated Mode of supply, application, composition, polymerisation reaction of each. Technical considerations: Methods of manipulation for each type of resin. Physical properties of denture base resin. Miscellaneous resins & techniques: Repair resins, Relining and rebasing. Short term and long-term soft-liners, temporary crown and bridge resins, Resin impression trays, Tray materials, Resin teeth, materials in maxillofacial prosthesis, Denture cleansers, Infection control in detail, Biological properties and allergic reactions.	**3**
	Restorative resins: - Section B Historical background, Resin based restorative materials, unfilled & filled, Composite restorative materials, Mode of supply, Composition, Polymerisation mechanisms: Chemically activated, Light activated, Dual cure: Degree of conversion, Polymerisation shrinkage. Classification of Composites: Application, composition and properties of each, Composites of posterior teeth, Prosthodontics resins for veneering. Biocompatibility - microleakage, pulpal reaction, pulpal protection Manipulation of	**4**

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	composites: Techniques of insertion of Chemically activated, light activated, dual cure Polymerisation, Finishing and polishing of restoration, Repair of composites. Direct bonding, Need for bonding, Acid - etch technique, Enamel bonding, Dentin bonding agents. Mode of bonding, Bond strength, Sandwich technique its indication and procedure Extended application for composites: Resins for restoring eroded teeth, Pit and fissure sealing, Resin inlays system - Indirect & direct, Core build up, Orthodontic applications.	
8.	**Metals and alloys - Section B** Structure and behaviour of metals, Solidification of metals, mechanism of crystallisation amorphous & crystalline. Classification of alloys, Solid solutions, and Constitutes or equilibrium phase diagrams: Electric alloys, Physical properties, Peritectic alloys, Solid state reaction other binary systems: Metallography & Heat treatment Tarnish and corrosion Definition, causes of corrosion, protection against corrosion, Corrosion of dental restorations, clinical significance of galvanic current. Dental amalgam- Section B History, Definition of dental amalgam, application, Alloy classification, manufacture of alloy powder composition - available as. Amalgamation: setting reaction & resulting structure, properties, Micro leakage Dimensional stability, Strength, Creep, Clinical performance Manipulation: Selection of alloy, proportioning, mechanism of trituration, condensation, carving & finishing. Effect of dimensional changes, Marginal deterioration. Repair of amalgam, mercury toxicity, mercury hygiene. Direct filling gold- Section B Properties of pure gold, mode of adhesion of gold for restoration forms of direct filling gold for using as restorative material. Classification: Gold Foil, Electrolytic precipitate, powdered gold Manipulation: Removal of surface impurities and compaction of direct filling gold. Physical properties of compacted	**10**
9.	**Dental casting alloys - Section B** Historical background, desirable properties of casting alloys. Alternatives to cast metal technology: direct filling gold, amalgam, mercury free condensable intermetallic compound - an alternative to metal casting process. CAD-CAM process for metal & ceramic inlays - without need of impression of teeth or casting procedure, pure titanium, most bio compatible metal which are difficult to cast can be made into crowns with the aid of CAD- CAM technology . Another method of making copings - by copy milling (without casting procedures). Classification of casting alloys: By function &	**6**

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	description. Recent classification, High noble (HN), Noble (N) and predominantly base metal (PB) Alloys for crown & bridge, metal ceramic & removable partial denture. Composition, function, constituents and application, each alloy both noble and base metal, Properties of alloys: Melting range, mechanical properties, hardness, elongation, modulus of elasticity, tarnish and corrosion. Casting shrinkage and compensation of casting shrinkage. Biocompatibility - Handling hazards & precautions of base metal alloys, casting investments used. Heat treatment: Softening & hardening heat treatment. Recycling of metals. Titanium alloys & their application, properties & advantages. Technical considerations in casting. Heat source, furnaces, gold, Clinical performance.	
10	**Dental waxes including inlay casting wax - Section B** Introduction and importance of waxes: Sources of natural waxes and their chemical nature. Classification of Waxes: Properties: melting range, thermal expansion, mechanical properties, flow & residual stresses, ductility. Dental Wax: Inlay wax: Mode of supply: Classification & composition, Ideal requirements: Properties of inlay wax: Flow, thermal properties Wax distortion & its causes. Manipulation of inlay wax: Instruments & equipment required, including electrically heated instruments metal tips and thermostatically controlled wax baths. Other waxes: Applications, mode of supply & properties. Casting Wax, Base plate wax, Processing wax, Boxing wax, Utility wax, Sticky wax, Impression wax for corrective impressions Bite registration wax.	**2**
11	**Dental casting investments - Section A** Definition, requirements, classification Gypsum bonded - classification. Phosphate bonded, Silica bonded Mode of Supply: Composition, application, setting mechanism, setting time & factors controlling. Expansions: Setting expansion, Hygroscopic Setting expansion, & thermal expansion: factors affecting. Properties: Strength, porosity, and fineness & storage. Technical considerations: For Casting procedure Preparation of die, Wax pattern, spruing, investing, control of shrinkage compensation, wax burnout, and heating the invested ring, casting. Casting machines, source of heat for melting the alloy. Defects in casting.	2
12	**Soldering, brazing and welding - Section B(Classes to be handled by orthodontics department)** Need of joining dental appliances, Terms & Definition, Solders: Definition, ideal requirement, types of solders - Soft & hard and their fusion temperature, application. Mode of supply of solders, Composition and selection, Properties. Tarnish & corrosion	**2**

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	resistance mechanical properties, microstructure of soldered joint. Fluxes & Anti fluxes: Definition, Function, Types, commonly used fluxes & their selection Technique of Soldering & Brazing: free hand soldering and investment, steps and procedure. Welding,: Definition, application, requirements, procedure, weld decay - causes and how to avoid it. Laser welding.	
13	**Wrought base metal alloys - Section A (Classes to be handled by orthodontics department)** Applications and different alloys used mainly for orthodontics purpose Stainless steel Cobalt chromium nickel Nickel titanium Beta titanium Properties required for orthodontic wires, working range, springiness, stiffness, resilience, Formability, ductility, ease of joining, corrosion resistance, stability in oral environment, bio compatibility Stainless steels: Description, type, composition & properties of each type. Sensitisation & stabilisation, Mechanical properties - strength, tensile, yield strength, KHN. Braided & twisted wires their need, Solders for stainless steel, Fluxes, Welding. Wrought cobalt chromium nickel alloys, composition, allocation, properties, heat treatment, physical properties. Nickel - Titanium alloys, shape, memory & super elastic Titanium alloys, application, composition, properties, welding, Corrosion resistance	**3**
14	**Dental cements- Section B** Definition & Ideal requirements of Dental Cements: Silicate, Glass ionomer, metal modified glass ionomer, resin modified glass ionomer, zinc oxide Euginol, modified zinc oxide Euginol, zinc phosphate, zinc silico phosphate, zinc poly carboxylate Cavity liners and cement bases Varnishes Calcium hydroxide. Gutta percha Application, classification (general and individual), setting mechanism, mode of supply, Properties, factors affecting setting, special emphasis on critical procedures of manipulation and protection of cement, mode of adhesion, biomechansim of caries inhibition. Agents for pulpal protection, Modifications and recent advances, Principles of cementation. Special emphasis on cavity liners and cement bases and luting agents.	**5**
15	**Dental ceramics - Section A** Historical background & General applications of Dental ceramics: definition, classification, application, mode of supply, manufacturing procedure, methods of	**8**

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	strengthening. Properties of fused ceramic: Strength and factors affecting, modulus of elasticity, surface hardness, wear resistance, thermal properties, specific gravity, chemical stability, esthetic properties, biocompatibility, technical considerations. Metal Ceramics (PFM): Alloys - Types and composition of alloys Ceramic - Type and Composition. Metal Ceramic Bond, Nature of bond. Bonding using electro deposition, foil copings, bonded platinum foil, swaged gold alloy foil coping. Technical considerations for porcelain and porcelain fused metal restorations. Recent advances - all porcelain restorations, Manganese core, injection moulded, castable ceramics, glass infiltrated alumina core ceramic (In ceram), ceramic veneers, inlays and onlays, and CAD - CAM ceramic. Chemical attack of ceramic by fluoride. Porcelain furnaces.	
16	**Abrasion & polishing agents - Section A** Definition of abrasion and polishing. Need of abrasion and polishing. Types of abrasives: Finishing, polishing & cleaning. Types of abrasives: Diamond, Emery, aluminum oxides garnet, pumice, Kieselgurh, tripoli, rouge, tin oxide, chalk, chromic oxide, sand, carbides, diamond, zirconium silicate Zinc oxide. Abrasive action. Desirable characteristics of an abrasive, Rate of abrasion, Size of particle, pressure and speed. Grading of abrasive & polishing agents. Binder, Polishing materials & procedures used. Technical consideration, Material and procedure used for abrasion and polishing Electrolytic polishing and burnishing.	**1**
17	**Die and counter die materials including electroforming and electro polishing - Section A** Types - Gypsum products, Electroforming, Epoxy resin, Amalgam	**1**
18	**Dental implants - Section A** Evolution of dental implants, types and materials.	**2**
19	**Mechanics of cutting - Section B** Burs and points.	**1**
20	**Waste disposal - Section B** At the end of the course the student should have the knowledge about the composition, properties, manipulative techniques and their various commercial names. The student should also acquire skills to select and use the materials appropriately for laboratory and clinical use. (1) Qualitative observation of restorative dental resins. (2) Determination of setting time of chemically activated composite resins.	**1**

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g) PRACTICALS: 240 Hours (40 hours in First BDS & 200 Hours in second BDS)

Demonstration of manipulation of all materials (for a batch not more than 8 students).

Exercises to be done by each student:

Impression material

Manipulation, making impressions, identifying setting time and defects. (Comparative studies included)

Gypsum products

Manipulation, pouring impressions-identify setting time and working time and relation of working time with reference to proportion of water, change in temperature and spatulation time.

Self-cure and heat cure acrylic resin-manipulation and curing.

Cements-manipulation and studying setting time and working time for luting, base and restoration.

Silver Amalgam-manipulation, trituration, condensation and studying setting and working time.

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h) SCHEME OF EXAMINATION:

The University Theory examination will have two sections of 35 marks each Section A Prosthodontics & Section B Conservative Dentistry *(overlapping of topics may occur)*

For Dental Materials University Practical Examination, if internal examiner is from Prosthodontics, External examiner should be from Conservative Dentistry and vice versa

Distribution of Topics and Type of Questions for written examination

Section A: Prosthodontics

Contents	Types of Questions and Marks	Marks
Question from any Prosthodontic topic preferably included in Section A	Structured Essay 1x 10marks	10
Questions from any Section A topic including orthodontics. Avoid questions in the topic from which long essay question is set	Short Notes 2 x 5marks	10
	Brief Notes 5x3marks	15
	Total	**35**

i. ***Theory:***

University written Examination: **35Marks**
University Viva: **10Marks**
Internal Assessment: **5 Marks**
Total: 50 Marks

ii. ***Practicals:***

Internal Assessment: **10 Marks**
University Practicals: **40Marks**
Total: 50 Marks
Grand Total 100Marks

Spotters (*5x 2Marks)* *10 Marks*

Manipulation of Any one of the following Dental materials: *25 Marks*

Gypsum products

Irreversible Hydrocolloid

Impression Compound

Rubber base impression Material

Zinc Oxide Impression Material

Heat cured PMMA

Practical Work Record *5 Marks*

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Distribution of Topics and Type of Questions for University Written examination:

Section B: Conservative Dentistry

Contents	Types of Questions and Marks	Marks
Question from Any Conservative Dentistry topic preferably included in Section B	Structured Essay 1x 10marks	10
Questions from any Section B topic including orthodontics. Avoid questions in the topic from which long essay question is set	Short Notes 2 x 5marks	10
	Brief Notes 5x3marks	15
	Total	**35**

i. ***Theory:***

University written Examination: **35Marks**
University Viva: **10Marks**
Internal Assessment: **5 Marks**
Total: 50 Marks

ii. ***Practicals:***

Internal Assessment: **10 Marks**
University Practicals: **40Marks**
Total: 50 Marks
Grand Total 100Marks

Spotters (*5x 2Marks)* *10 Marks*

Manipulation of Any one of the following Dental Cements: *25 Marks*

ZnO Euginol (Luting/Filing Consistency)

Zinc Phosphate Cement (Luting/base Consistency)

Glass Ionomer Cement Type I/II (Luting/Filling Consistency)

Polycarboxylate Cement (Luting Consistency)

Amalgam Trituration

Practical Work Record *5 Marks*

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8. GENERAL AND DENTAL PHARMACOLOGY AND THERAPEUTICS

a) GOAL:

The broad goal of teaching under graduate students in pharmacology is to inculcate rational and scientific basis of therapeutics keeping in view of dental curriculum and Profession.

b) OBJECTIVES:

At the end of the course the student shall be able to:

i. Describe the pharmacokinetics and pharmacodynamics of essential and commonly used drugs in general and in dentistry in particular,

ii. List the indications, contraindications; interactions, and adverse reactions of commonly used drugs with reason,

iii. Tailor the use of appropriate drugs in disease with consideration to its cost, efficacy, safety for individual and mass therapy needs,

iv. Indicate special care in prescribing common and essential drugs in special medical situations such as pregnancy, lactation, old age, renal, hepatic damage and immuno compromised patients,

v. Integrate the rational drug therapy in clinical pharmacology,

vi. Indicate the principles underlying the concepts of "Essential drugs".

vii. Recognise and report adverse drug reaction to suitable authorities.

c) SKILLS:

At the end of the course the student shall be able to:

i. Prescribe drugs for common dental and medical ailments.

ii. To appreciate adverse reactions and drug interactions of commonly used drugs.

iii. Observe experiments designed for study of effects of drugs.

iv. Critically evaluate drug formulations and be able to interpret the clinical pharmacology of marketed preparations commonly used in dentistry.

d) INTEGRATION:

Practical knowledge of use of drugs in clinical practice will be acquired through integrated teaching with clinical departments.

e) THEORY: 70 HOURS

1. **General Pharmacology :**	
a. Definitions: Pharmacology, drug, Pharmacy, sources of drugs with examples.	1
b. Pharmacokinetics with clinical implications.	2
c. Routes of administration: oral, inhalation, intradermal, Subcutaneous, intramuscular, intravenous, intrathecal, perineural &Newer drug regimes. (Advantages and disadvantages with the examples of drugs administered).	1
d. Pharmacodynamics: mechanism of action ,factors modifying drug actions	2

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with emphasis on factors like-age, sex, dose ,frequency & route of administration, presence of other drugs, Pharmacogenetics and Pathological conditions.	
e. Therapeutics: Principles of drug therapy, Adverse drug reactions and drug interactions.	3
2.ANS drugs: Clinically used examples, their important pharmacological actions (which form the basis for the uses),clinical uses along with dental uses if any and specific adverse effect s of-	
a. Sympathomimetics	1
b. Sympatholytics-alphablockers, Beta -blockers.	2
c. Cholinomimetics.	2
d. Anticholinergics & Skeletal muscle relaxants	2
3. Detailed pharmacology of:	
a.Clinically used opioid and non-opioid analgesics.	2
b. Clinically used local anesthetics.	2
Detailed Pharmacology &Enumeration of clinically used agents, their brief Pharmacology, clinical uses along with dental uses if any, and specific adverse effects of:	
a. Ethylalcohol- actions, uses and drug interactions.	1
b. General anesthetics & Pre-anaesthetic medication	2
c. Antipsychotics, antidepressants, anxiolytics	2
d. Sedativehypnotics	2
e. Antiepileptics	1
CVS drugs: Enumeration/Classification of clinically used agents their important pharmacological actions(that form the basis of their uses)Clinical uses along with dental uses if any, and specific adverse effects of	
a. Cardiac glycosides	1
b. Antiangina drugs	1
c. Antihypertensives.	1
d. Diuretics	1
e. Pharmacotherapy of shocks-anaphylactic, cardiogenic hypovolemic &Septic.	1
Drugs acting on blood: Detailed pharmacology of:	
a. Coagulants, anticoagulants, fibrinolytics, antiplatelet drugs and styptics	3
b. Hematinics: Iron preparationVit.B12,FolicacidVit.C	3
c. Vit.D and calcium preparations	1
Endocrines: Enumeration/Classification of clinically used agents and their preparations, Mechanism of action, clinical uses along with dental uses if any and specific adverse effects of:	
a. Drugs used in diabetes mellitus	2
b. Corticosteroids	2
Chemotherapy: Enumeration/Classification of clinically used Agents, their mechanism of	

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action clinical uses along with dental uses if any and specific adverse effects of:	
a. Sulfonamides	1
b. Beta-lactum antibiotics	2
c. Macrolides and aminoglycosides	1
d. Broad spectrum antibiotics	1
e. Antifungal and antiviral (acyclovir) agents	2
f. Metronidazole and fluoroquinolones	1
g. Antineoplastic Drugs: Alkylating agents, Antimetabolities, Radioactive Isotopes, Vinka Alkaloids, Anticancer antibiotics.	2
h. Drug Therapy of Tuberculosis, Leprosy & Malaria	3
Other drugs: Enumeration o clinically used agents, general uses along with dental uses if any and specific adverse effects of:	
a. Antihistamines and anti emetics	2
b. Drugs used in bronchial asthma and cough	1
c. Drugs used in peptic ulcer	2
d. Chelating agents-BAL, EDTA & Penicillamine	1
e. Antihelminthics	2
Dental Pharmacology	
a. Fluoride pharmacology	1
b. Antiseptics, astringents & Sialogogues	1
c. Obtundents, Mummifying agents and disclosing agents	1
d.***Prevention and drug therapy of emergencies in dental practice***	2
1. Seizures	
2. Anaphylaxis	
3. Severe bleeding	
4. Shock	
5. Tetany	
6. Status asthmaticus	
7. Acute addisonian crisis	
8. Diabetic Ketoacidosis	

f) PRACTICALS AND DEMONSTRATIONS: 20 HOURS

To familiarise the student with the methodology: prescription writing and dispensing.

Rationale of drug combinations of marketed drugs.

Sl. No.	Procedure	Hours
1	Introduction-equipments used in dispensing pharmacy, prescription-parts and model prescription.	2
2	Demonstration of common dosage forms used in clinical practice	
3	Mixtures-one example(Expectorant/Salicylate)of simple and diffusible (Bismuth Kaolin/chalk)mixtures	2

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4	Emulsion-Types and example(Liniment turpentine/Shark liver oil) of emulsion	2
5	Powders-toothpowder	2
6	Mandl's paint/Gum paint percentage dilution-concept and calculations with suitable examples.	2
7	Mouthwashes-Alkaline, antiseptic, astringent	2
8	Toothpastes	2
9	Prescription writing for15 general conditions commonly encountered in clinical practice. eg. Bronchial asthma, hypertension congestive heart failure, angina pectoris, peptic ulcer, bacillary dysentery,diabetes mellitus, diabetic coma, osteoarthritis, anaphylaxis, status asthmaticus, Status epilepticus, iron deficiency & pernicious anaemia	2
10	Dental prescriptions for about fifteen dental conditions commonly encountered in practice eg. Acute necrotising ulcerative gingivitis, acute herpetic gingivitis/stomatitis, acute gingival abscess, pericoronal abscess (impacted teeth), dental caries, aphthous ulcers, hypersensitive dentine, dentoalveolar abscess, xerostomia, acute toothache, post-operative pain, post extraction pain with swelling, oral candidiasis, acute tonsillitis/ pharyngitis,common cold,scurvy etc.	2

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g) SCHEME OF EXAMINATION

Distribution of Topics and Type of Questions for University Written examination:

Contents	Types of Questions and Marks	Marks
Questions from Pharmacokinetics, pharmacodynamics, antibiotics, NSAID's, Local Anaesthetics, Anticoagulants, Beta blockers, Glucocorticoids, Calcium Channel blockers, ACE inhibitors, Opioid analgesics, Sympathomimetics, Anti-Cholinergics, Cardiac Glycosides, Dental Pharmacology.	Structured Essays 2x 10marks	20
Questions should Preferably be set from all other chapters excluding the one from which a Long Essay Question has been set	Short notes 4 x 5marks	20
	Brief Notes 10x3marks	30
	Total	**70**

i. Theory

University Written **70Marks**

Internal Assessment **20 Marks**

Viva Voce **10 Marks**

ii. Practicals:

University Practical Examination: **80 Marks**

Spotters *10x 1Mark* *10 Marks*

Prescriptions (1 Medical & 1 Dental) *2x10Marks* *20 Marks*

Preparations (1 Medical & 1 Dental) 2x20Marks *40 Marks*

Practical Work Record *10 Marks*

Internal Assessment **20 Marks**

Grand Total 200Marks

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9. PRE CLINICAL CONSERVATIVE DENTISTRY

a) LABORATORY EXERCISES

Sl.No.	Practical exercise	Hours
1	Identification and study of hand cutting instruments chisels, gingival margin trimmers, excavators and hatchet.	3
2	Identification and use of rotary cutting instruments in contra angle hand pieces burs (Micromotor)	2
3	Preparation of class I and extended class I and class II and MOD's and class V amounting to 10 exercises in plaster models	30
4	Exercises on phantom head models(Typhodonts) which includes tooth preparation, base and varnish application, matrix and wedge placement followed by amalgam restoration	95
	Class I 5 Class I with extension 2 Class II 10 Class II MODS 2 Class V and III for glass ionomer 4 Class V for amalgam 2	
5	10 exercises on mounted extracted teeth .Tooth preparation, base application, matrix and wedge placement, and restoration with amalgam.	20
	Class I 2 Class I with extension 2 Class II 4 Class V 2	
	Polishing of above restorations	
6	Management of deep caries a. Pulp capping : Direct/ Indirect on extracted teeth	3
7	Demonstration of Light cure composite and Glass Ionomer Restorations.	
8	Cast Restoration –Inlay preparation:	20
	Class I 1 To prepare Wax patterns	
	Class II 2+1 MOD To prepare wax patterns	
	Class V 1 (posterior)	

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9	Pulpotomy on extracted posterior teeth	
10	Endodontic exercises. Root canal access preparation on Upper Extracted Central incisor. Determination of working length Demonstration of Instrumentation and Obturation of root canal space. Restoration of access preparation	27

To appear for IIBDS preclinical Conservative Dentistry examination it is Mandatory that Laboratory exercises from No. 1to No. 7 mentioned in the table above is completed.

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b) SCHEME OF EXAMINATION

i. Practicals

University practical examination	60
University Viva Voce	20
Internal Assessment	20
Grand Total	**100**

Distribution of Marks for Preclinical Conservative Dentistry University Practical Examination

(1) Tooth Preparation and Restoration *45 Marks*

(2) Spotters (5 x 2 Marks) *10 Marks*

(3) Preclinical Practical Work Record *05 Marks*

Total: 60 Marks

Practical Exercise No*. (1):* 45 Marks

Class II Conventional / Conservative preparation for Silver Amalgam restoration on Maxillary or Mandibular first or second Molar typhodont tooth.

Cavity preparation	*45 Minutes*	*20 Marks*
Base and Matrix	*15 Minutes*	*10 Marks*
Amalgam restoration and carving	*30 Minutes*	*15 Marks*

Practical Exercise No. *(2):*

Spotters: Time: (2 minutes each x *5)* *10 Minutes* *10Marks*

Type of Spotters:

Hand instruments used for tooth preparation and restoration

Identification of Root Canal Instruments

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10. PRE CLINICAL ORTHODONTICS

a) SCHEME OF STUDY

The undergraduate study of orthodontics spans over second year, third year and fourth year. In second year the emphasis is given for basic and preclinical wire bending exercises and appliance fabrication.

b) AN OUTLINE OF THE COURSE CONTENT:

Preclinical basic wire bending exercises enable the candidate to get accustomed with the orthodontic wire, learn the basic skills of wire bending, learn how to construct various components of removable appliances and to acrylise various removable appliances.

c) PRATICAL TRAINING DURING SECOND YEAR B.DS

Sl .No.	Topic	Hours
1	Basic wire bending exercises • Straightening of wire • Equilateral triangle • Square • Rectangle • Circle • U – V	40
2	Pre clinical wire bending exercises (Mandatory) • C – clasp • Full clasp • Triangular clasp • Adams clasp • Finger spring • Double cantilever spring • Coffin spring • Short labial bow • Long labial bow • Split labial bow	60

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	• U loop buccal canine retractor • Helical canine retractor • Self supported canine retractor Pre clinical wire bending exercises (Desirable) • Palatal canine retractor • T spring • Reverse labial bow • Roberts retractor	
3	Appliance fabrication • Hawley's appliance • any one of the habit breaking appliance - a. Tongue guard appliance b. Oral screen • Desirable appliances a) Hawley' s appliance with Anterior bite plane b) Hawley 's appliance with PBP and Z spring c) Catalans appliance d) Expansion appliance	60

Theory topics listed below to be covered in second BDS. Lecture hours should be adjusted with the practical classes.

a) Introduction to orthodontics
b) Removable appliances - parts, uses, modifications, advantages, disadvantages etc.
c) Wrought wire alloys
d) Soldering and welding

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d) SCHEME OF EXAMINATION

i. Practicals

University practical examination	***60***
University Viva Voce	***20***
Internal Assessment	***20***
Grand Total	***100***

Distribution of Marks for Preclinical Orthodontics University Practical Examination

(1) Wire bending exercises *55 Marks*

(2) Preclinical Practical Work Record *05 Marks*

Wire bending exercises and their mark distribution should be as follows:

a) Labial bow 20 Marks

b) Clasp 20 Marks

c) Spring 15Marks

Note: Preclinical viva should be limited to, Orthodontic material science (orthodontic wire alloys, impression materials, acrylic, Gypsum products), removable appliances, study models, soldering and welding

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11. PRECLINICAL PROSTHODONTICS AND CROWN & BRIDGE

a) LABORATORY EXERCISES: Total 380 Hours (I yr. 100, II yr. 200, IIIyr.80)

Sl.No.	Practical Exercise	Hours
	Laboratory steps related to complete denture	
1	Impression and model preparation	
2	Preparation of special trays in shellac base plates – trimmed margin. Maxillary & Mandibular	
3	Special tray in self cured acrylic resin. Maxillary & Mandibular	
4	Preparation of heat cured acrylic permanent bases. Maxillary & Mandibular	
5	Preparation of Self cured acrylic temporary bases Maxillary & Mandibular	**150**
6	Preparation of occlusion rims	
7	Articulating the model in Mean value articulator	
8	Teeth arrangement in Mean value articulator (Class I) - 5 Numbers	
9	Processing trial denture in heat cured acrylic- 1	
10	Repair of fractured Denture	
	Laboratory steps related to partial denture	
11	Fabrication of heat cured acrylic Partial Dentures – (Kennedy class I, class II, class III &class IV)	
12	Surveying a model (demo only)	**100**
13	Preparation of wax pattern on models for cast RPD (Kennedy class I &class II,)	
14	Preparation of wax pattern on models for cast RPD (Kennedy class III & class IV,)demo only	
	Maxillofacial Prosthesis	
14	Preparation of Obturators	**50**
	Fixed Prosthodontics	
16	Preparation of full crowns on large sized teeth – anterior all ceramic & posterior PFM.	**80**
17	Preparation of full crowns on Typhodont anterior teeth on phantom head.	

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A work record should be maintained by all students and should be submitted at the time of examination after due certification from the Head of the Department.

To appear for IIBDS preclinical Prosthodontics examination it is Mandatory that Laboratory exercises from Nos. 1 to 11 mentioned in the table above are completed.

b) SCHEME OF EXAMINATION

i. Practicals

University practical examination	***60***
University Viva Voce	***20***
Internal Assessment	***20***
Grand Total	***100***

Distribution of Marks for Preclinical Prosthodontics University Practical Examination

(1) Arrangement of teeth in class I relation, Waxing, Carving & Polishing: 35 Marks

(2) Drawing the Design for a Cast Partial Denture and marking its components 15 Marks

(3) Preclinical Practical Work Record 10 Marks

Note: Preclinical viva should be limited to, Laboratory Procedures related to Complete Denture Fabrication, Articulators, Anatomical landmarks, Impression Procedures, Introduction to jaw relation recording, Selection & arrangement of teeth, Complete Denture Occlusion, Try in Procedures and Components of RPD & FPD.

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12. GENERAL MEDICINE

a) GUIDELINES:

Special emphasis should be given throughout on the importance of various diseases as applicable to dentistry.

i. Special precautions/ contraindication for anaesthesia in oral and dental procedures in different systemic diseases.

ii. Oral manifestations of systemic diseases.

iii. Medical emergencies in dental practice.

A dental student should be taught in such a manner that he/she is able to record the arterial pulse, blood pressure and be capable of suspecting by sight and superficial examination of the body, diseases of the heart, lungs, kidneys, blood etc. He should be capable of handling medical emergencies encountered in dental practice.

b) THEORY: 60 HOURS

CORE TOPICS	Hours
1. Aims of medicine, definitions of diagnosis, treatment & prognosis. History taking, Physical examination of the patient, diagnosis and management of disease. Genetics and disease, Medical Ethics.	2
2.Infections: Enteric fever, HIV, Herpes simplex, Herpes zoster, Syphilis ,Diphtheria, Malaria, Actinomycosis, Viral hepatitis, Tuberculosis. Infectious mononucleosis Mumps, Measles, Rubella, Leprosy, Organisation and functions of the immune systems.	5
3. G.I.T: Stomatitis, Gingival hyperplasia, Dysphagia, Acid peptic disease, Jaundice, Acute and chronic hepatitis, Cirrhosis of liver, Ascitis, Amoebiasis, Tender hepatomegaly, Hepatotoxic drugs, Portal hyper tension. Diarrhoea and Dysentery including Malabsorbtion syndromes,Helicobacter pylori.	5
4. CVS :Acute rheumatic fever Valvular heart disease, Hypertension, Ischemic heart disease (myocardial infarction), Infective endocarditis, Common arrhythmias, Classification of congenital heart disease, Congestive cardiac failure. Heart failure, Fallot's tetralogy, ASD, VSD.	7
5.Respiratory System: Applied Anatomy and physiology of RS, Pneumonia, COPD, Pulmonary tuberculosis, Bronchial asthma, Pleural effusion, Acute respiratory tract infections, Pulmonary embolism, Suppurative lung diseases, and Lung abscess. Pneumothorax, Bronchiectasis Lung Cancer, Empyema, Sleep apnea, ARDS, Respiratory failure.	6
6.Hematology: Hematopoiesis, Anaemias, Bleeding & Clotting disorders, Acute and chronic myeloid leukemias, Agranulocytosis and Neutropenia, Thrombocytopenia , Splenomegaly Lymphomas, Oral manifestations of haematological disorders, Generalized Lymphadenopathy. Principles of blood and blood products transfusion, Thromboembolic disease, Oncogenesis, Haemolytic anemia, DIC (Disseminated Intravascular	**7**

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Coagulation).	
7.Renal System :Acute nephritis and Nephrotic syndrome, U.T.I Renal function tests ,CRF	**5**
8. Nutrition: Balanced diet, PEM, Vitamin deficiency disease, Calcium and phosphate metabolism, Flurosis, Osteomalacia, Osteoporosis.	4
9. CNS: Facial palsy, Facial pain Trigeminal neuralgia, Epilepsy, Headache including migraine. Meningitis (Acute and Chronic) Anticonvulsants, Examination of comatose patient, Examination of cranial nerves.	7
10. Endocrine: Diabetes mellitus Acromegaly, Hypothyroidism, Thyrotoxicosis, Calcium metabolism and parathyroids. Addison's disease, Cushing's syndrome, Parathyroid disease and calcium metabolism, Preoperative assessment of diabetic patients, Acute adrenal deficiency.	**6**
11. Critical care: Syncope, Cardiac arrest, Cardio Pulmonary Resuscitation (CPR), Cardiogenic shock, Anaphylaxis, Allergy, Angio -neurotic edema. Acute LVF, ARDS, Coma.	**4**
Miscellaneous: Adverse drug reactions, Drug interactions. Rheumatoid disease, Osteoarthritis, Scleroderma.	

c) CLINICAL TRAINING: 90 HOURS (posting in a general hospital)

The student must be able to take history, do general physical examination (including build, nourishment, pulse, BP, temperature, edema, respiration, clubbing, cyanosis, jaundice, lymphadenopathy, and oral cavity) and be able to examine CVS, RS, abdomen and facial nerve and signs of meningeal irritation.

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d) SCHEME OF EXAMINATION

Distribution of Topics and Types of Questions for University Written Examination:

Types of Questions and Distribution of Marks	Total Marks
Structured Essays 2x 10marks	20
Short notes 4 x 5marks	20
Brief notes 10x3marks	30
Total	**70**

i. Theory

University Written **70 Marks**

Viva Voce **20 Marks**

Internal Assessment **10 Marks**

ii. Clinical:

University Clinical Examination: **80 Marks**

Case History	*15 Marks*
Clinical Examination	*30 Marks*
Investigation	*10Marks*
Diagnosis & D.D	*15 Marks*
Management	*10 Marks*

Internal Assessment: **20 Marks**

Grand Total 200Marks

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13. GENERAL SURGERY

a) AIMS:

To acquaint the student with various diseases which may require surgical intervention. And to train the student to analyze the disease history and be able to do a thorough physical examination of the patient. The diseases as related to head and neck region are to be given due importance, at the same time other relevant surgical problems are also to be addressed. At the end of one year of study the student should have a good theoretical knowledge of various ailments, and be practically trained to differentiate benign and malignant diseases and be able to decide which patient requires further evaluation.

b) OBJECTIVES:

Skills to be developed by the end of teaching are to examine a routine swelling, ulcer and other related diseases and to perform minor surgical procedures such as draining an abscess, taking a biopsy etc.

c) THEORY: 60 HOURS

Sl. No.	Topic	Hours
1	HISTORY OF SURGERY: The development of surgery as a specialty over the years, will give the students an opportunity to know the contributions made by various scientists, teachers and investigators. It will also enable the student to understand the relations of various specialties in the practice of modern surgery.	1
2	GENERAL PRINCIPLES OF SURGERY: Introduction to various aspects of surgical principles as related to orodental diseases. Classification of diseases in general. This will help the student to understand the various diseases, their relevance to routine dental practice.	2
3	PRINCIPLES OF OPERATIVE SURGERY: Principles as applicable to minor surgical procedures including detailed description of asepsis, antiseptics, sterilisation, principles of anaesthesia and principles of tissue replacement. Knowledge of sutures, drains, diathermy, cryosurgery and use of Laser in surgery.	1
4	WOUNDS: Their classification, wound healing, repair, treatment of wounds, skin grafting, medicolegal aspects of accidental wounds and complications of wounds.	3

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5	INFLAMMATION: Of soft and hard tissues. Causes of inflammation, varieties, treatment and sequelae.	1
6	INFECTIONS: Acute and chronic abscess skin infections, cellulitis, carbuncle, and erysipelas. Specific infections such as tetanus, gangrene, syphilis, gonorrhoea, tuberculosis, Actinomycosis, Vincents angina, cancrum oris. Pyaemia, toxaemia and septicaemia.	5
7	TRANSMISSABLE VIRAL INFECTIONS: HIV and Hepatitis B with special reference to their prevention and precautions to be taken in treating patients in a carrier state.	2
8	SHOCK AND HAEMORRHAGE: Classification, causes, clinical features and management of various types of shock. Syncope, Circulatory collapse. Haemorrhage -different types, causes, clinical features and management. Blood groups, blood transfusion, precautions and complications of blood and their products. Hemophilia's, their transmission, clinical features and management especially in relation to minor dental procedures.	5
9	TUMOURS, ULCERS, CYSTS, GANGRENE, SINUS, AND FISTULAE: Classification, clinical examination and treatment principles in various types of benign and malignant tumours, ulcers, cysts, gangrene, sinus and fistulae.	9
10	DISEASES OF LYMPHATIC SYSTEM: Especially those occurring in head and neck region. Special emphasis on identifying diseases such as tubercular infection, lymphomas, leukaemias, metastatic lymph node diseases.	1
11	DISEASES OF THE ORAL CAVITY: Infective and malignant diseases of the oral cavity and oropharynx including salivary glands with special emphasis on preventive aspects of premalignant and malignant diseases of the oral cavity.	2
12	NECK SWELLINGS – Midline and Lateral swellings, Cystic and Solid swellings –Classification, Differential diagnosis, Treatment	1
13	DISEASES OF LARYNX, NASOPHARYNX: Infections and tumours affecting these sites. Indications, procedure and complications of tracheostomy.	2
14	NERVOUS SYSTEM: Surgical problems associated with nervous system with special reference to the principles of peripheral nerve injuries, their regeneration and principles of treatment. Detailed description of afflictions of facial nerve And its management. Trigeminal neuralgia, its	1

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	presentation and treatment.	
15	FRACTURES: General principles of fractures, clinical presentation and treatment with additional reference to newer methods of fracture treatment. Special emphasis on fracture healing and rehabilitation.	1
16	HEAD INJURY MANAGEMENT	1
17	MANAGEMENT OF SEVERELY INJURED PATIENT – RESUSCITATION	1
18	DISEASES OF ARTERIES AND VEINS IN GENERAL –Varicose veins, Atherosclerosis, Aneurysm, Carotid Body tumours	1
19	ANOMALIES OF DEVELOPMENT OF FACE: Surgical anatomy and development of face. Cleft lip and cleft palate—principles of management.	1
20	DISEASES OF THYROID AND PARATHYROID: Surgical anatomy, pathogenesis, clinical features and management of dysfunction of thyroid and parathyroid glands. Malignant diseases of the thyroid—classification, clinical features and management.	2
21	SWELLINGS OF THE JAW: Differential diagnosis and management of different types of swellings of the jaw, Osteomyelitis of mandible	2
22	BIOPSY: Different types of biopsies routinely used in surgical practice.	1
23	BURNS AND SCALDS	1

Desirable to know: Introduction to oncology, radiotherapy, surgery and genetic engineering

E.N.T: Ear: Middle ear infection; Nose: Para nasal sinuses; Throat: Tonsillitis & Peritonsillar Abscess

d) CLINICALS: 90 HOURS (posting in a general hospital)

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e) SCHEME OF EXAMINATION

Distribution of Topics and Types of Questions for University Written examination:

Types of Questions and Distribution of Marks	Total Marks
Structured Essays 2x 10marks	20
Short Notes 4 x 5marks	20
Brief Notes 10x3marks	30
Total	**70**

i. Theory

University Written **70 Marks**

Viva Voce **20 Marks**

Internal Assessment **10 Marks**

ii. Clinical:

University Clinical Examination: **80 Marks**

Long Case

Case History	*15 Marks*
Clinical Examination	*30 Marks*
Suggested Investigations	*10Marks*
Diagnosis & D.D	*15 Marks*
Management	*10 Marks*

Internal Assessment: **20 Marks**

Grand Total 200Marks

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14. ORAL PATHOLOGY & ORAL MICROBIOLOGY

a) OBJECTIVES:

At the end of Oral Pathology & Microbiology course, the student should be able to:

i. Comprehend the different types of pathological processes that involve the Orofacial tissues.

ii. Comprehend the manifestations of common diseases, their diagnosis & correlation with clinical pathological processes.

iii. Understand the oral manifestations of systemic diseases and correlate with the systemic physical signs & laboratory findings.

iv. Understand the underlying biological principles governing treatment of oral diseases.

v. Understand the principles of certain basic aspects of Forensic Odontology.

b) SKILLS:

The Following skills are to be developed:

i. Microscopic study of common lesions affecting oral tissues through microscopic slides & projection slides

ii. Study of the disease process by surgical specimens

iii. Study of teeth anomalies/polymorphisms through tooth specimens & plaster casts.

iv. Microscopic study of plaque pathogens

v. Study of haematological preparations (blood films) of anaemias & leukemias

vi. Basic exercises in Forensic Odontology such as histological methods of age estimation and appearance of teeth in injuries.

c) THEORY: 145 Hours (II yr. 25 hrs. III yr. 120 hrs.)

Sl. No:	Topics for II year	Description	Hours
1	**Introduction**	Scope and Outline of Oral Pathology, Broad divisions, Interrelationship with medical specialities	1
2	**Developmental disturbances of oral & paraoral structures**	a) Developmental disturbances of Jaws - Agnathia, Micrognathia, Macrognathia, Facial Hemihypertrophy, Facial Hemiatropy b) Developmental Disturbances of lips and palate - Congenital Lip pits and Commissural pits and fistulas	

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		- Double lip, Cleft lip, cleft Palate, Chelitis Glandularis, Chelitis Granulomatosa, Hereditary Intestinal Polyposis, Hereditary Melanotid Macule c) Developmental disturbances of Oral Mucosa - Fordyce's Granules - Focal epithelial Hyperplasia d) Developmental disturbances of gingiva - Fibromatosis Gingiva, Retrocuspid Papilla e) Developmental Disturbances of Tongue - Macroglossia, Microglossia, Ankyloglossia, Cleft Tongue, Fissured Tongue, Median Rhomboid Glossitis, Benign Migratory Glossitis, Hairy Tongue. f) Development disturbances of oral lymphoid tissue: - Reactive lymphoid aggregates - Lymphoid hamartoma - Angiolymphoid Hyperplasia - Lympho-epithelial cyst g) Developmental disturbances of salivary glands: - Aplasia, Xerostomia, Hyperplasia of the palatal glands, Atresia, Abberrancy, Stafine's cyst h) Developmental disturbances in size of teeth: - Microdontia, Macrodontia i) Developmental disturbances in the shape of the teeth: 79 - Fusion, Germination, Concrescence, Dilacerations, Talon's Cusp, Dens in Dente, Dens Evaginatus, Taurodontism, Supernumerary Roots, Enameloma j) Developmental Disturbances in number of teeth - Anodontia, Supernumerary teeth, Predecidious and Post	14

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		Permanent dentition k) Developmental Disturbances in Structure of Teeth: - Amelogenesis Imperfecta, Enamel Hypoplasia, Dentinogenesis Imperfecta, Dentinal dysplasia, Regional Odontodysplasia, Shell Teeth. l) Developmental Disturbances in eruption of teeth: - Premature Eruptions, Eruption Sequestrum, Delayed Eruption, Multiple Unerupted teeth, Submerged Teeth. m) Developmental / Fissural cysts of the Oral cavity - Median palatal cyst, Globulomaxillary cyst, Median Mandibular cyst, Naso-alveolar cyst, Palatal cyst of neonates, Thyroglossal duct cyst, Epidermoid, and Dermoid cyst, Nasopalatine cyst.	
3	**Dental caries**	Theories, Clinical features, Classification, Histopathology, Microbiology of Dental caries ,Immunology, Caries activity tests, Factors influencing caries	4
4	**Diseases of the Pulp & Periapical tissues**	a) Diseases of the Dental Pulp - Pulpitis, Focal Reversible Pulpitis, Chronic Pulpitis, Pulp Polyp. b) Diseases of the Periapical Tissues - Periapical Granuloma, Periapical Abscess, Periapical Cyst c) Osteomyelitis - Acute Suppurative Osteomyelitis, Chronic Focal and Diffuse Sclerosing Osteomyelitis, Garre's Ostemyelitis Sequelae of periapical abscess - summary of space infections, systemic complications & significance Cellulitis, Ludwig's angina, Intra cranial complication of dental infection, Maxillary sinusitis, Focal infection and foci of infection	6
	Topics for III Year	**Description**	
1	Benign and	Classification of Odontogenic, Non-Odontogenic & Salivary	

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	malignant tumours of Oral cavity	Gland Tumours. Etiopathogenesis, clinical features, histopathology, radiological features & laboratory diagnosis (as appropriate) of the following common tumours :- 1.Odontogenic tumours -Classification Benign a.Odontogenic epithelium without odontogenic ectomesenchyme-Ameloblastoma, Calcifying Epithelial Odontogenic Tumour, Adenomatoid Odontogenic Tumour, Squamous Odontogenic tumour b.Odontogenic epithelium with Odontogenic ectomesenchyme-Ameloblastic Fibroma ,Ameloblastic fibro odontoma, Odontoma,Dentinogenic Ghost cell Tumour c.Odontogenic ectomesenchyme with or without included odontogenic epithelium-Peripheral and Central odontogenic fibroma, Odontogenic Myxoma, Benign cementoblastoma Malignant a.Odontogenic carcinomas: Metastasizing ameloblastoma, Ameloblastic carcinoma 2. Non-odontogenic a. Benign tumours of epithelial tissue origin -Papilloma, Keratoacanthoma,Nevus b. Premalignant lesions and conditions -Definition, Classification -Epithelial dysplasia -Leukoplakia, Carcinoma in situ, Erythroplakia, Oral submucous fibrosis c. Malignant tumours of epithelial tissue origin -Basal cell carcinoma, Epidermoid carcinoma (Epidemiology, etiology, clinical & histological features, Grading and TNM staging), Verrucous carcinoma ,Malignant melanoma, Recent advances in diagnosis , management and prevention of Oral cancer d. Benign tumours of Connective tissue origin -Fibroma, Giant cell fibroma, Peripheral and Central ossifying fibroma,	1 9 30

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		Lipoma, Haemangioma(different types), Lymphangioma, Chondroma, Osteoma, Osteoid osteoma, Benign osteoblastoma, Tori and Multiple exostoses e. Tumour like lesions of Connective tissue origin- -,Peripheral ossifying fibroma f. Malignant tumours of Connective tissue origin -Fibrosarcoma, Chondrosarcoma, Kaposi's sarcoma, Ewing's sarcoma, Osteosarcoma ,Hodgkin's and Non Hodgkin's lymphoma, Burkitt's lymphoma, Multiple myeloma, Solitary Plasma cell myeloma g. Benign tumours of Muscle tissue origin -Leiomyoma, Rhabdomyoma, Congenital Epulis of new born, Granular cell tumour h. Benign and Malignant tumours of Nerve tissue origin -Neurofibroma and Neurofibromatosis, Schwannoma, Melanotic neuroectodermal tumour of infancy, Malignant Schwannoma. i. Metastatic tumours of Jaws and Soft tissues of Oral cavity 3. Salivary Gland Benign neoplasms - Pleomorphic Adenoma, Warthin's tumour, & Oncocytoma. Malignant neoplasms –Malignant Pleomorphic adenoma Adenoid Cystic Carcinoma, Mucoepidermoid Carcinoma, Acinic Cell Carcinoma & Adenocarcinomas.	8
2	**Cysts of the Oral & Paraoral region**	Classification, etiopathogenesis, clinical features, histopathology, laboratory & radiological features (as appropriate) of Odontogenic cysts- Odontogenic keratocyst, Dentigerous cyst, Primordial cyst, Dental lamina cyst of newborn ,Gingival cyst of adults, Lateral periodontal cyst, Calcifying odontogenic cyst, Radicular cyst N on-Odontogenic cysts- Pseudocysts of jaws, Aneurysmal bone cyst, Traumatic bone cyst & soft tissue cysts of oral & paraoral region.	8
3.	**Non neoplastic Salivary Gland**	Sialolithiasis,Sialosis, Sialadenitis, Xerostomia & Ptyalism. Sjogren's syndrome ,Benign lymphoepithelial lesion,	2

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	Diseases :	Necrotizing sialometaplasia	
4.	**Traumatic, Reactive & Regressive lesions of Oral Cavity :**	Pyogenic granuloma, Peripheral& Central Giant cell granuloma, exostoses Fibrous Hyperplasia, Traumatic Ulcer, mucocele & Traumatic Neuroma. Attrition, Abrasion, Abfraction Erosion, Bruxism, Hypercementosis, Dentinal changes, Pulp calcifications & Resorption of teeth. Radiation effects of oral cavity, Allergic reactions of the oral cavity. -Angioedema, Stomatitis medicamentosa, Stomatitis venenata	5
5.	**Microbial infections of oral soft tissues :**	Microbiology, defense mechanisms including immunological aspects, oral manifestations, histopathogy and laboratory diagnosis of common bacterial, viral & fungal infections namely :- Bacterial: Scarlet fever, Diphtheria, Tuberculosis, Syphilis, Actinomycoses & its complications - Cancrum Oris, Tetanus, Noma. Viral: Herpes Simplex, Varicella zoster, Measles, Mumps & HIV infection and Oral manifestation of AIDS. Fungal : Candidiasis, Histoplasmosis Immunological diseases: Reccurent Aphthous stomatitis, Bechet's syndrome, Reiter's syndrome, Sarcoidosis.	10
6.	**Common non-inflammatory diseases involving the jaws**	Etiopathogenesis, clinical features, radiological & laboratory values in diagnosis of: Fibrous dysplasia, Cherubism, Osteogenesis Imperfecta, Paget's bone disease, Cleidocranial dysplasia, Rickets, Achondroplasia, Marfan's syndrome , Down's syndrome and Histiocytosis X disease.	6
7.	**Biopsy, Cytology and Healing of Oral wounds**	Factors affecting healing of wounds -healing of extraction wound and Dry socket Biopsy-techniques, Healing of biopsy wound -Exfoliative cytology-Indications, Staining and Interpretation	4
8.	**Systemic Diseases**	Brief review & oral manifestations, diagnosis & significance of common Blood, Nutritional, Hormonal & Metabolic diseases of	4

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	involving Oral cavity	Oral cavity. a. Blood dyscrasias-Clinico-pathological aspects and oral manifestations of Anemias,Polycythemia,Leukopenia,Neutropenia,Agranulocytosis,Chediak-Higashi syndrome, Leukocytosis, Infectious mononucleosis, Leukemias , Purpura Haemophilia b. Oral aspects of Disturbances in mineral metabolism c. Oral aspects of Avitaminosis and Hypervitaminoses d. Oral Aspects of Endocrine dysfunction	5
9.	**Mucocutaneous lesions :**	Etiopathogenesis, clinical features & histopathology of the following common lesions. Lichen Planus, Lupus Erythematosus, Pemphigus & Pemphigoid lesions, Erythema Multiforme, Psoriasis, Scleroderma, Ectodermal Dysplasia, Epidermolysis bullosa & White sponge nevus.	10
10.	**Periodontal Diseases :**	Stains, Calculus, Dental plaque Etiopathogenesis, microbiology, clinical features, histopathology & radiological features (as appropriate) of gingivitis, gingival enlargement, ANUG, chronic desquamative gingivitis periodontitis and juvenile periodontitis. Basic immunological mechanisms of periodontal disease to be highlighted.	4
11.	**Diseases of TM Joint**	Ankylosis, luxation and subluxation, summary of different types of arthritis & other developmental malformations, traumatic injuries & myofascial pain dysfunction syndrome.	2
12.	**Diseases of the Nerves :**	Facial neuralgias – Trigeminal, Sphenopalatine & Glossopharyngeal neuralgias, VII nerve paralysis, Causalgia Psychogenic facial pain & Burning mouth syndrome.	2
13.	**Pigmentation of Oral tissues**	Pigmentation of Oral & Paraoral region & Discolouration of teeth : Causes & clinical manifestations.	2
14.	**Diseases of Maxillary Sinus**	Traumatic injuries to sinus, Sinusitis, Cysts & Tumours involving antrum	2
	Principles of Basic Forensic	Introduction, definition, aims & scope. Sex and ethnic (racial) differences in tooth morphology and	

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15.	**Odontology**	histological age estimation Determination of sex & blood groups from buccal mucosa / saliva. Dental DNA methods Bite marks, rugae patterns &lip prints Dental importance of poisons and corrosives Overview of forensic medicine and toxicology	6

d) LABORATORY/PRACTICAL REQUIREMENTS

Students have to maintain records of laboratory procedures/work done/report of practical:

i. Oral Pathology and Microbiology

Identification of the hard tissue anomalies:

Microdontic tooth

Macrodontic tooth

Gemination of tooth

Fused teeth

Concrescence of tooth

Dilaceration

Dens in dente

Dens evaginatus

Supernumerary root

Hypoplastic enamel

Fluorosis

Abrasion

Attrition

Fracture tooth

Stained tooth

Hypercementosis

Complex &Compound Odontomes

Examination of the following gross specimens:

Papilloma

Fibroma

Torus

Carcinoma of oral structures

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Salivary Gland Tumours

Ameloblastoma

Periapical Granuloma

Dentigerous Cyst

Pulp Polyp

Histopathologic review of:

Peripheral Giant Cell Granuloma

Leukoplakia

Carcinoma in situ

Oral Submucous Fibrosis

Carcinoma of Oral Mucosa

Pleomorphic Adenoma

Malignant Pleomorphic Adenoma

Mucous extravasation cyst

Mucous retention cyst

Warthin's tumour

Adenoid cystic carcinoma

Periapical cyst

Dentigerous Cyst

Odontogenic Keratocyst

Ameloblastoma

Gingival Hyperplasia

ANUG

Lichen Planus

Pemphigus

Dental Caries

ii. **Forensic Pathology**

Age determination from skull.

Gustafson's method of age determination- using incisors

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e) SCHEME OF EXAMINATION

Distribution of Topics and Types of Questions for University Written Examination:

Contents	Types of Questions and Distribution of Marks	Total Marks
One or both questions can be from Oral pathology.	Essays 2x 10marks	20
A. Oral Pathology - three questions B. Oral Microbiology - one question	Short Notes 4x5marks	20
A. Oral Pathology - eight questions B. Forensic Odontology - two questions	Brief Notes 10x3marks	30
	Total	**70**

i. Theory

University Written **70 Marks**

Viva Voce **20Marks**

Internal Assessment **10 Marks**

ii. Clinical:

University Clinical Examination: **80 Marks**

Spotters (Specimen-identification & points in support-5x 4 Marks) *20 Marks*

Histopathology slides(Diagram, Labelling and salient features) 10x4 *40Marks*

Forensic Odontology (Estimation of age from ground sections) 10 Marks

Clinical Work Record & Seminar *10 Marks*

Internal Assessment: **20 Marks**

Grand Total 200Marks

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15. PUBLIC HEALTH DENTISTRY

a) *GOAL:*

To prevent and control oral diseases and promote oral health through organized community efforts

b) OBJECTIVES:

i. ***Knowledge:***

At the conclusion of the course the student shall have a knowledge of the basis of public health, preventive dentistry, public health problems in India, palliative care, Nutrition, Environment and their role in health, basics of dental statistics, epidemiological methods, National oral health policy with emphasis on oral health policy.

ii. ***Skill and Attitude:***

At the conclusion of the course the students shall have acquired the skill of identifying health problems affecting the society, conducting health surveys, conducting health education classes and deciding health strategies. Students should develop a positive attitude towards the problems of the society and must take responsibilities in providing health and palliative care.

iii. ***Communication abilities:***

At the conclusions of the course the student should be able to communicate the needs of the community efficiently, inform the society of all the recent methodologies in preventing oral disease.

PALLIATIVE CARE:

Objective of including palliative care in to the curriculum of BDS:

Objective of the curriculum is to train future dental surgeons in the basics of Palliative Medicine. Palliative medicine is the branch of medicine involved in the treatment of patients with advanced, progressive, life-threatening disease for whom the focus of care is maximising their quality of life through expert symptom management, psychological, social and spiritual support as part of a multi-professional team. Government of Kerala has declared palliative care as part of Primary Health Care. Dental surgeons come across many patients with chronic and incurable diseases like cancer, HIV-AIDS etc. Also learning the symptom, control and communication will help them to provide better care to the patients coming under their care.

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Structure of the Training:

The palliative care training will be given in the third academic year. The training to include didactic sessions, role plays, discussions, case presentations

Theory*: Introduction (3 hours), Communication (5 hours), Pain management (3 hours), Nursing care (3 hours). Total 14 hours

**Classes in Palliative care to be handled by faculty in Public Health Dentistry who have undergone training in palliative care from KUHS recognised centres.*

1: Introduction to palliative care

Learning Outcomes:

The trainee will be able to discuss the philosophy and definitions of palliative care. The trainee will demonstrate that this knowledge and understanding improves his/ her clinical practice, decision-making and management of practice.

The trainee will demonstrate the knowledge, attitudes and skills required to foster timely and efficient communication between services necessary for a smooth continuum of patient care

The trainee will demonstrate the skilful application of knowledge and understanding to prepare individuals for bereavement, to support the acutely grieving person/family. This will include the ability to anticipate / recognise abnormal grief and access specialist help

The trainee will demonstrate an understanding of the theoretical basis for applied ethics in clinical practice, and be able to evaluate personal attitudes, beliefs and behaviours.

The trainee will demonstrate an awareness of, and respect for, the social and cultural values and practices of others

The trainee will recognise differences in beliefs and personal values. The trainee will be able to deal with conflicts in the beliefs and values within the clinical team. The trainee will recognise the psycho social and spiritual components of problems in advanced diseases and understand the role of non-professional members of the community in addressing them.

Block 1: Philosophy and Principles of palliative care.

Unit 1: Definitions- hospice, palliative care and terminal care, Principles of palliative care. Quality of Life (QOL), concepts of 'Good Death', grief, bereavement team work, inter and multidisciplinary teams. Role of family and community, ethics, spirituality

- Definitions of: palliative care approach; general palliative care; specialist palliative care; hospice; specialist palliative care unit; palliative medicine; supportive care

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- Evolving nature of palliative care over the course of illness, including integration with active treatment, and the significance of transition points
- Differing concepts of what constitutes quality of life (including measurement) and a "good death"
- Re-adaptation and rehabilitation
- Shared care with other members of the team and community as a doctor and an individual
- Communication skills relevant to negotiating these roles
- Critical analysis of current theoretical approaches to: medical ethics, including 'four principles (beneficence, non-maleficence, justice and respect for autonomy)
- Understanding the concept of spirituality

2: Psychological issues and communication

Learning Outcomes:

The trainee will demonstrate knowledge and understanding of psychological responses to illness in a range of situations, and skills in assessing and managing these in practice
The trainee will demonstrate good communication skills and use of reflective practice to ensure these skills are maintained.
The trainee will be able to identify obstacles to communication and demonstrate skills in overcoming these.
The trainee will demonstrate a professional attitude to confidentiality

Block 1: Communication.

Unit 1: Communication- Different types, barriers, how to overcome?
Unit 2: Breaking bad news, and handling uncertainty, collusion, denial, anxiety, depression, anger

- Skills in active listening, open questioning and information giving to:
- elicit concerns across physical, psychological, social and spiritual domains
- managing awkward questions and information giving, sensitively and as appropriate to wishes and needs of the individual
- facilitate decision making and promote autonomy of the individual patient
- Ensure that the patient is apprised of arrangements for the continuity of their care and whom to contact in case of need.

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- Knowledge of theories and evidence base for communication practice including breaking bad news, collusion and discussing natural death
- Awareness of different styles of communications and critical evaluation of own consulting skills
- Awareness of common barriers to communication for both patients and professionals
- Awareness of common communication problems: deafness, expression and learning disabilities
- A professional understanding of the ethical and legal aspects to confidentiality

Block 2: The family in palliative care.

Unit 1: Terminal/ Chronic illnesses- problems of families.

Unit 2: Coping with the problems - patient to family, family to palliative Care worker, patient to palliative care worker

3: Management of pain

Learning outcomes:

The trainee will have the knowledge, understanding and skills to manage pain in patients with life limiting progressive diseases

Block 1: Pharmacological Management of pain.

Unit 1: General considerations, pathophysiology, types and assessment of pain

Unit 2: WHO analgesic ladder

Unit 3: Opioids, nonopioid analgesics and adjuvants in pain management.

Unit 4: Neuropathic pain, diagnosis and management

Unit 5: Other Pains- Breakthrough pain, incident pain, end of dose pain –management

Unit 6: Relevant invasive procedures for pain management.

4: Nursing Care

Learning outcomes:

The trainee will inculcate knowledge and skills required to identify, manage and refer problems in need of specific nursing interventions during the course of palliative care

Block 1: Mouth care & nutrition

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Unit 1: Management of oral problems in advanced/terminal disease

Unit 2: Nutritional requirements in chronic /terminal disease.

Block 2: Wound care

Unit 1: Prevention and Management of Pressure sores, fungating and Painful ulcers

Unit 2: Management of bleeding from wounds.

c) ***THEORY: 74 HOURS (III yr. 24hrs, Final Yr. Part I. 50 hrs)***

Sl.No.	Topic	No. of hours
1.	Introduction to Dentistry: Definition of Dentistry, History of dentistry, Scope, aims and objectives of Dentistry.	3
2.	**Public Health:**	
	i. Health & Disease: - Concepts, Philosophy, Definition and Characteristics	4
	ii. Public Health: - Definition & Concepts, History of public health	1
	iii. General Epidemiology: - Definition, objectives, methods	3
	iv. Environmental Health: - Concepts, principles, protection, sources, purification environmental sanitation of water, disposal of waste, sanitation, their role in mass disorder	3
	v. Health Education: - Definition, concepts, principles, methods, and health education aids	2
	vi. Public Health Administration: - Priority, establishment, manpower, private practice management, hospital management	1
	vii. Ethics and Jurisprudence: Professional liabilities, negligence, malpractice, consents, evidence, contracts, and methods of, identification in forensic dentistry	3
	viii. Nutrition in oral diseases	1
	ix. Behavioral science: Definition of sociology, anthropology and psychology and their relevance in dental practice and community	3
	x. Health care delivery system: Center and state, oral health policy, primary health care, national programmes, health	2

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	organizations. Primary Health care counselling	
3.	**Dental Public Health**	
	i. Definition and difference between community and clinical health.	2
	ii. Epidemiology of dental diseases-dental caries, periodontal diseases, malocclusion, dental fluorosis and oral cancer.	6
	iii. Survey procedures: Planning, implementation and evaluation, WHO oral health survey methods 1997, indices for dental diseases	3
	iv. Delivery of dental care: Dental auxiliaries, operational and non-operational, incremental and comprehensive health care, school dental health.	2
	v. Payments of dental care: Methods of payments and dental insurance, government plans	2
	vi. Preventive Dentistry- definition, Levels, role of individual, community and profession, fluorides in dentistry, plaque control programmes.	5
4.	**Research Methodology and Dental Statistics**	
	i. Health Information: - Basic knowledge of Computers, MS Office, Window 2000, Statistical Programmes	1
	ii. Research Methodology: -Definition, types of research, designing a written protocol	1
	iii. Bio-Statistics: - Introduction, collection of data, presentation of data, Measures of Central tendency, measures of dispersion, Tests of significance, Sampling and sampling techniques-types, errors, bias, blind trails and calibration.	6
5.	**Practice Management**	
	i. Place and locality ii. Premises & layout iii. Selection of equipments iv. Maintenance of records/accounts/audit.	4
	v. Dentist Act 1948 with amendment. Dental Council of India and State Dental Councils Composition and responsibilities.	1
	vi. Indian Dental Association Head Office, State, local and	1

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	branches.	
6.	**Palliative Care**	
	i. Introduction	3
	ii. Communication	5
	iii. Pain management	3
	iv. Nursing care	3

d) ***PRACTICALS/CLINICALS/FIELD PROGRAMME IN PUBLIC HEALTH DENTISTRY:***

These exercises designed to help the student in IV and V year:

i. Understand the community aspects of dentistry

ii. To take up leadership role in solving community oral health programme

iii. To gain hands on experience on research methodology

e) PRACTICALS: 200 HOURS (III Yr.60Hrs.Final Yr. Part I 140Hrs.)

Sl.No.	Exercise	No. of hours
1.	**Short term research project:** Epidemiology & Advocacy Purpose: Apply the theory and practice of epidemiology, planning and evaluation, statistics to dental public health. Most of the students are unfamiliar with research and hence this short term project which will be divided across two years (IV and V BDS) would address this issue. Depending on the topic chosen student can incorporate a) Collection of statistical data (demographic) on population in India, birth rates, morbidity and mortality, literacy, per capita income b) Incidence and prevalence of common oral diseases like dental caries, periodontal disease, oral cancer, fluorosis at national and international levels c) Preparation of oral health education material posters, models, slides, lectures, plays acting skits etc. d) Oral health status assessment of the community using indices and WHO basic oral health survey methods **e)** Exploring and planning setting of private dental clinics in rural, semi urban and urban locations, availment of finances for dental practices-preparing project report.	60
2.	**Field visits**	100

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	a) Visit to primary health center-to acquaint with activities and primary health care delivery. b) Visit to water purification plant/public health laboratory/center for treatment of western and sewage water c) Visit to schools-to assess the oral health status of school children, emergency treatment and health education including possible preventive care at school (tooth brushing technique demonstration and oral rinse programme etc.) d) Visit to institution for the care of handicapped, terminally ill, physically, mentally, or medically compromised patients **Note :** Field visits should have relevance to the short term research project as far as possible Minimum of two visits – one per year (IV and V BDS)	
3. **4.**	**Preventive dentistry**: in the department application of pit and fissure sealants, fluoride gel application procedure, A. R. T., Comprehensive health for 5 pts at least 2 patients. Statistical exercise	40

Note: *The colleges are encouraged to involve in the National Service Scheme. programme for students to carry out social work in rural areas.*

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SCHEME OF EXAMINATION

Distribution of Topics and Types of Questions for University Written Examination:

Contents	Types of Questions and Distribution of Marks	Total Marks
Any topic within the syllabus of Public Health Dentistry	Structured Essays 2x 10marks	20
	Short Notes 4 x 5marks	20
Any topic within the syllabus of Public Health Dentistry two questions from palliative care	Brief Notes 10x3marks	30
	Total	**70**

iii. Theory

University Written **70 Marks**

Viva Voce **20 Marks**

Internal Assessment **10 Marks**

iv. Clinical:

University Clinical Examination: **80 Marks**

Case history taking *10 Marks*

Assessment of oral health status using any 2 relevant indices *30Marks*

Spotters (Epidemiology, biostatistics, Preventive dentistry, Bioethics) 20Marks

Oral Health Education Talk/ Presentation of oral health education material/Short term student research project presentation /statistical test 15 Marks

Record 5Marks

Internal Assessment: **20 Marks**

Grand Total 200Marks

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16. PERIODONTOLOGY

a) OBJECTIVES:

The student shall acquire the skill to:-

i. Perform dental scaling diagnostic tests of periodontal diseases

ii. To use the instruments for periodontal therapy and maintenance of the same.

The student shall develop attitude to:-

i. Impart the preventive measures namely, the prevention of periodontal diseases and prevention of the progress of the disease

ii. Perform the treatment with full aseptic precautions

iii. Shall develop an attitude to prevent iatrogenic diseases

iv. To conserve the tooth to the maximum possible time by maintaining periodontal health

v. To refer the patients who require specialist's care.

b) THEORY: 80 HOURS (III yr.30hrs,Final yr. Part I . 50 hrs)

Topic	Hours
1. Introduction, Definition of Periodontology, Periodontics, Periodontia, Brief historical background, Scope of Periodontics	**1**
2. Development of periodontal tissues, Micro-structural anatomy and biology of periodontal tissues in detail Gingiva. Junctional epithelium in detail, Epithelial-Mesenchymal interaction, periodontal ligament, Cementum, Alveolar bone	**1**
3. Defensive mechanisms in the oral cavity: Role of Epithelium, Gingival fluid, Saliva and other defensive mechanisms in the oral environment	**1**
4. Age changes in teeth and periodontal structures and their association with periodontal diseases and their significance in Geriatric dentistry	**1**
5. Classification of periodontal diseases: need for classification, Scientific basis of classification, Classification of gingival and periodontal diseases as described in World Workshopl989	**1**
6. Gingivitis: Plaque associated, ANUG, steroid hormone influenced, Medication influenced, Desquamative gingivitis, other forms of gingivitis as in nutritional deficiency, bacterial and viral infections etc.	**1**
7. Periodontitis: Adult Periodontitis, rapidly progressive Periodontitis A &B, Juvenile Periodontitis (localized, generalized, and post-juvenile), Prepubertal Periodontitis, Refractory Periodontitis	**1**
8. Gingival diseases: Localized and generalized gingivitis, Papillary, marginal	**7**

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and diffuse gingivitis aetiology, pathogenesis, clinical signs, symptoms and management of	
a) Plaque associated gingivitis	
b) Systemically aggravated gingivitis (sex hormones, drugs and systemic diseases)	
c) ANUG	
d) Desquamative gingivitis-Gingivitis associated with Lichen Planus, Pemphigoid, Pemphigus, and other Vesiculobullous lesions	
e) Allergic gingivitis	
f) Infective gingivitis-Herpetic, Bacterial and Candidial	
g) Pericoronitis	
h) Gingival enlargement (classification and differential diagnosis)	
9. Epidemiology of periodontal diseases Definition of index, incidence, prevalence, epidemiology, endemic, epidemic, and pandemic Classification of indices (Irreversible and reversible), deficiencies of earlier indices used in Periodontics, Detailed understanding of Silness & Loe Plaque Index, Loe & Silness Gingival Index, CPITN &CPL, Prevalence of periodontal diseases in India and other countries. Public health significance (All these topics are covered at length under community dentistry. Hence, the topics may be discussed briefly. However, questions may be asked from the topics for examination.)	**3**
10. Extension of inflammation from Gingiva, mechanism of spread of inflammation from gingival area to deeper periodontal structures, Factors that modify the spread	**1**
11. Pocket ,Definition, signs and symptoms, classification, pathogenesis, histopathology, root surface changes and contents of the pocket	**1**
12. Etiology	**5**
a) Dental Plaque (Biofilm), Definition, New concept of Biofilm , Types, composition, bacterial colonization, growth, maturation &disclosing agents, Role of dental plaque in periodontal diseases, Plaque microorganisms in detail and bacteria associated with periodontal diseases, Plaque retentive factors, Materia alba, Food debris	
b) Calculus, Definition, Types, composition, attachment, theories of formation, Role of calculus in disease	

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c) Food Impaction, Definition Types, Etiology, Hirschfield's classification, Signs, symptoms & sequelae of treatment	
d) Trauma from occlusion, Definition, Types, Histopathological changes, Role in periodontal disease, Measures of management in brief	
e) Habits, Their periodontal significance, Bruxism & Parafunctional habits, tongue thrusting, lip biting, occupational habits	
f) Iatrogenic factors,	
(i) Conservative Dentistry:-Restorations, Contact point, marginal ridge, surface roughness, overhanging restorations, interface between restoration and teeth	
(ii) Prosthodontics, Interrelationship, Bridges and other prosthesis, Pontics (types), surface contour, relationships of margins to the periodontium, gingival protection theory, muscle action theory& theory of access to oral hygiene.	**4**
(iii) Orthodontics, Interrelationship, removable appliances & fixed appliances, Retention of plaque, bacterial changes	
g) Systemic diseases, Diabetes, Sex hormones, nutrition (Vit.C& proteins),AIDS & periodontium, Hemorrhagic diseases, Leukemia, clotting factor disorders, PMN 1disorder	**1**
13. Risk factors, Definition, Risk factors for periodontal diseases	**1**
14. Host response: Mechanism of initiation and progression of periodontal diseases, Basic concepts about cells, Mast cells, neutrophils, macrophages, lymphocytes, immunoglobulins, complement system, immune mechanisms & cytokines in brief, Stages in gingivitis-Initial, early, established & advanced, Periodontal disease activity, continuous paradigm, random burst & asynchronous multiple burst hypothesis	**2**
15. Periodontitis:	
a) Etiology, histopathology, clinical signs & symptoms, diagnosis and treatment of adult Periodontitis	**5**
b) Periodontal abscess; definition, classification, pathogenesis, differential diagnosis and treatment	
c) Furcation involvement, Glickman's classification, prognosis and	

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management	
d) Rapidly progressive Periodontitis Juvenile Periodontitis: Localized and generalized Post juvenile Periodontitis	
e) Periodontitis associated with systemic diseases ,Refractory Periodontitis	
16. Diagnosis:	
a) Routine procedures, methods of probing, 2 types of probes, (According to case history)	**3**
b) Halitosis: Etiology and treatment. Mention advanced diagnostic aids and their role in brief.	
17. Prognosis, Definition, types, purpose and factors to be taken into consideration	**1**
18. Treatment plan Factors to be considered	**1**
19. Periodontal therapy	
a) General principles of periodontal therapy. Phase I, II, III, IV therapy.	
b) Definition of periodontal regeneration, repair, new attachment and reattachment	
c) Plaque control	**5**
(i) mechanical :tooth brushes, Interdental cleaning aids, dentifrices	
(ii) Chemical: classification and mechanism of action of each & pocket irrigation	
20. Pocket eradication procedures	
a) Scaling and root planning: Indications, Aims & objectives, Healing following root planning, Hand instruments, sonic, ultrasonic & Piezo-electric Scalers	
b) Curettage: Definition Indications present concepts Aims &objectives, Procedures & healing response	**5**
c) Flap surgery: Definition, Types of flaps, Design of flaps, papilla preservation Indications & contraindications, Armamentarium, Surgical procedure & healing response	
21. Osseous Surgery:	
a) Osseous defects in periodontal disease, Definition, Classification	**6**
b) Surgery: resective, additive osseous surgery (osseous grafts with	

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classification of grafts)	
c) Healing responses	
d) Other regenerative procedures; root conditioning	
e) Guided tissue regeneration	
22. Mucogingival surgery & periodontal plastic surgery:	**5**
a) Definition, Mucogingival problems: etiology,	
b) classification of gingival recession (P.D.Miller Jr. and Sullivan and Atkins), Indications, objectives	
c) Gingival Augmentation procedures apical and coronal to recession :	
d) Frenectomy, Frenotomy	
e) Crown lengthening procedures	
f) Periodontal microsurgery in brief	
g) Splints: Periodontal splints, Purpose & classification, Principles of splinting	**1**
h) Hypersensitivity, Cause, theories & Management	**1**
i) Implants: Definition, types, scope & biomaterials used, Periodontal considerations: such as Implant-bone interface, Implant-Gingiva interface, Implant failure, Peri-implantitis &management	**1**
23. Maintenance phase (SPT):	**4**
a. Causes, Theories & management	
b. Aims, objectives, and principles	
c. Importance	
d. Procedures	
e. Maintenance of implants	
24. Pharmacotherapy:	**4**
a. Periodontal dressings	
b. Antibiotics & anti-inflammatory drugs	
c. Local drug delivery systems	
25. Periodontal management of medically compromised patients: Topics concerning periodontal management of medically compromised patients	**2**
26. Inter-disciplinary care: Pulpo-Periodontal involvement, Routes of spread of infection, Simons classification, Management	**1**
27. Systemic effects of periodontal diseases in brief: Cardiovascular diseases,	**1**

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Low birth weight babies etc.	
28. Infection control protocol: Sterilization and various aseptic procedures	**1**
29. Ethics.	**1**

c) TUTORIALS DURING CLINICAL POSTING:

i. Infection control
ii. Periodontal instruments
iii. Chair position and principles of instrumentation
iv. Maintenance of instruments (sharpening)
v. Ultrasonic, Piezoelectric and sonic scaling - demonstration of technique
vi. Diagnosis of periodontal disease and determination of prognosis
vii. Radiographic interpretation and lab investigations
viii. Motivation of patients- oral hygiene instructions
ix. Students should be able to record a detailed periodontal case history, determine diagnosis, prognosis and plan treatment.
x. Student should perform scaling, root plaining local drug delivery and SPT.
xi. Shall be given demonstration of all periodontal surgical procedures.

d) DEMONSTRATIONS:

i. History taking and clinical examination of the patients
ii. Recording different indices
iii. Methods of using various scaling and surgical instruments
iv. Polishing the teeth
v. Bacterial smear taking
vi. Demonstration to patients about different oral hygiene aids
vii. Surgical procedures- gingivectomy, gingivoplasty, and flap operations
viii. Follow up procedures, post operative care and supervision

e) MINIMUM CLINICAL REQUIREMENTS MANDATORY TO APPEAR FOR UNIVERSITY EXAMINATION:

i. Diagnosis, treatment planning, and discussion and total periodontal treatment- 10 cases (5 Long cases + 5 Short Cases)
ii. Supra gingival scaling 50 complete cases (including minimum 2 ultrasonic scaling) and oral hygiene instructions –
iii. Sub gingival Scaling and Root Plaining - 10 cases

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iv. Assistance in periodontal surgery- 2 cases

v. A work record should be maintained by all the students and should be submitted at the time of examination after due certification from the head of the department.

vi. Students should have to complete the work prescribed by the concerned department from time to time and submit a certified record for evaluation.

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f) SCHEME OF EXAMINATION

Distribution of Topics and Types of Questions for University Written Examination:

Contents	Types of Questions and Distribution of Marks	Total Marks
Questions from any of the Periodontology Topics	Structured Essays 2x 10marks	20
	Short Notes 4 x 5marks	20
	Brief Notes 10x3marks	30
	Total	**70**

v. Theory

University Written **70 Marks**

Viva Voce **20 Marks**

Internal Assessment **10 Marks**

vi. Clinical:

University Clinical Examination: **80 Marks**

Case History, Clinical Examination, Diagnosis &

Treatment Planning 30*Marks*

Oral prophylaxis 30 Marks

Clinical Work Record & Seminar 20 *Marks*

Internal Assessment: **20 Marks**

Grand Total 200Marks

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17. ORAL MEDICINE AND RADIOLOGY

a) AIM

i. To train the students to diagnose the common disorders of Orofacial region by clinical examination and with the help of such investigations as may be required and medical management of oro-facial disorders with drugs and physical agents.

ii. To train the students about the importance, role, use and techniques of radiographs and other imaging methods in diagnosis.

iii. The principles of the clinical and radiographic aspects of Forensic Odontology.

b) COURSE CONTENT

i. The syllabus in ORAL MEDICINE & RADIOLOGY is divided into two main parts.

Part-I: Diagnosis, Diagnostic methods and Oral Medicine {which is again subdivided into three sections. (a) Diagnostic methods (b) Diagnosis and differential diagnosis (c) Oral Medicine & Therapeutics} and Part-II: Oral Radiology. Emphasis should be laid on oral manifestations of systemic diseases and ill-effects of oral sepsis on general health.

ii. To avoid confusion regarding which lesion and to what extent the student should learn and know, this elaborate syllabus is prepared. As certain lesions come under more than one group, there is repetition.

c) THEORY: 75 HOURS (III YR. 25 HRS, FINAL YR. PART. I. 50 HRS.)

	THEORY TOPICS FOR THIRD YEAR (25 Hrs)	
Sl No	**Oral Medicine Topics**	**Hours**
1.	Introduction to oral medicine, terminologies & Ethics (Professional liabilities, negligence, malpractice, consent etc)	1
2.	Case history and clinical examination (examination of soft tissues and hard tissues, primary & secondary lesions, lymph nodes, TMJ, muscles of mastication, salivary glands, swelling, ulcer, white & red lesions, pigmented lesions)	2
3.	Lymphatic drainage of head and neck. D/d of cervical lymphadenopathy	1
4.	Investigations in oral medicine (chair side and laboratory investigations including haematological, microbiological, immunologic, biochemical and biopsy).	2
5.	Dental therapeutics (drugs commonly used: antibiotics, anti-inflammatory, analgesics, anaesthetics, steroids, topical applications, coagulants &anticoagulants, sialogogues).	2
6.	Emergencies in dental practice	1
7.	Developmental disorders of the teeth & paradental structures	1
8.	Acute and chronic infections of the jaws (sequalae of dental infection, spread of infection, facial space infections, osteomyelitis, foci of oral infections)	1
9.	Disorders of tongue	1
Total Oral Medicine teaching hours in third year		**12**
	Radiology Topics	
1.	History of dental radiology, Radiation Physics (electromagnetic spectrum, properties of X rays)	1

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2.	Construction and working of x-ray tube, production of X-rays, factors controlling x-ray beam, interaction of x-rays with matter	2
3.	Radiation biology.	1
4.	Radiation protection.	1
5.	Films used in dental radiology, grids and intensifying screen	1
6.	Intraoral radiographic techniques (periapical, bitewing, occlusal & localization techniques).	2
7.	Processing of X-ray films.	1
8.	Qualities of an ideal radiograph.	1
9.	Infection control and Quality assurance in Dental Radiology	1
10.	Radiographic normal anatomical landmarks.	2
Total Radiology teaching hours in third year		**13**
	THEORY TOPICS FOR FINAL YEAR PART I (50 Hrs)	
Sl	**Oral Medicine Topics**	**Hours**
1.	Oro Facial pain (Classification, differential diagnosis & management)	2
2.	White & Red lesions (classification, differential diagnosis and Management).	2
3.	Vesiculobullous & Ulcerative lesions (classification, differential diagnosis, management, a	2
4.	Bacterial (Bacterial, Viral & Fungal infections)	1
5.	Viral Infections of oral and paraoral structures	2
6.	Fungal Infections of oral and paraoral structures	1
7.	Granulomatous diseases affecting orofacial region	1
8.	Nutritional deficiencies (Vitamins, Minerals)	1
9.	Pigmented lesions affecting oral mucosa (exogenous & endogenous, differential	1
10	RBC &WBC disorders (oral manifestations & dental considerations)	2
11	Bleeding & Clotting disorders (Oral manifestations & Dental considerations)	1
12	System review in oral medicine - Endocrine (Pituitary, thyroid, Parathyroid, Adrenal,	1
13	System review in oral medicine - CVS (oral manifestation & dental considerations)	1
14	System review in oral medicine - CNS , GIT & Respiratory System (oral	2
15	System review in oral medicine - Renal System (oral manifestation & dental	1
16	Saliva as a diagnostic tool and salivary gland disorders (developmental, functional,	2
17	TMJ disorders (classification, developmental disorders, degenerative disorders, disc	1
18	Benign & malignant non - odontogenic tumors of the orofacial region (epithelial,	1
19	Fibroosseous lesions of jaws	1
20	Cysts & of orofacial region (Odontogenic & Non Odontogenic).	1
21	Odontogenic Tumors	1
22	Oral Cancer (Etiology, pathogenesis, clinical features, Diagnosis, management &	2
23	Forensic odontology	2
Total Oral Medicine teaching hours in final year part I		**33**
	Radiology Topics	
1.	Principles of radiographic interpretation.	1
2.	Faulty radiographs :- Causes and rectification	1
3.	Role of radiography in diagnosis of dental caries & periodontal disease.	1
4.	Periapical radiolucencies & Generalized rarefactions of jaws	1
5.	Pericoronal radiolucencies	1
6.	Multilocular radiolucencies	1

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7.	Radiopacities in jaws	1
8.	Mixed radiopaque - radiolucent lesions of jaws.	1
9.	Panoramic Radiography	1
10	Extra oral radiography &Imaging of maxillary sinus	1
11	TMJ radiography & Radiographic features of the diseases of TMJ.	1
12	Salivary gland imaging & Radiographic features of the diseases of salivary glands	1
13	Radiography of traumatized teeth & jaws	1
14	Contrast radiography, Radioisotopes & Scintigraphy	1
15	Digital radiography.	1
16	Recent imaging modalities and its application in dentistry (CT, CBCT, MRI & USG)	1
17	Role of radiographs in Forensic odontology	1
Total Radiology teaching hours in Final year Part I		**17**

d) CLINICALS:

1. Training in:
    - Patient examination
    - Patient assessment
    - Treatment planning
    - Medications if any, with dose
    - Follow up protocols
2. In view of the above each student shall maintain a record of work done, which shall be evaluated for marks at the time of university examination.
3. The minimum clinical requirement to appear for University examination is listed below:

Minimum clinical and academic requirements (Year wise split up)

Third Year

Sl No	Procedure	Minimum requirement
1	Short cases (routine OP)	40
2	Observation of specialty cases in the PG Clinic	5
3	Observation of minor surgical procedures	2
4	*Seminar on basic topics	1

Final year Part I

Sl No	Procedure	Minimum requirement
1	Short cases (routine OP)	60
2	Long Cases	10
3	Assisting minor surgical procedures	2
4	Taking & interpretation of IOPA radiographs	20
5	Taking & interpretation of Bitewing radiographs	2
6	Taking & interpretation of Occlusal radiographs	2
7	Observation of Specialized imaging modalities like panoramic & skull radiographs, CBCT, USG etc…	4
8	Seminars	2 (One Oral Medicine & One Radiology topic)

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e) SCHEME OF EXAMINATION

Distribution of Topics and Types of Questions for University Written Examination:

Contents	Types of Questions and Distribution of Marks	Total Marks
One question from oral medicine and one from radiology	Structured Essays 2x 10marks	20
A. Diagnostic Methods – Two questions B. Differntial Diagnosis - two questions C. Therapuetics– Two question D. Radiation Physics – One question E. Techniques – Two Questions F. Radiographic Interpretation – One Question	Short Notes 4 x 5marks	20
A. Four Questions from Oral Medicne B. Four Questions from Radiology C. Two from Forensic Odontology	Brief Notes 10x3marks	30
	Total	**70**

vii. Theory

University Written **70 Marks**

Viva Voce **20 Marks**

Internal Assessment **10 Marks**

viii. Clinical:

University Clinical Examination: **80 Marks**

Spotters (1 mark each)	*1x 10*	*10 Marks*
Discussion Long Case	*1x30*	*30 Marks*
Taking and Interpretation of Radiograph	*1x30*	*30 Marks*
Work Record and seminar		*10 Marks*

Internal Assessment: **20 Marks**

Grand Total 200 marks

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18. ORTHODONTICS AND DENTOFACIAL ORTHOPAEDICS

a) AIM

Undergraduate programme in Orthodontics is designed to enable the qualifying dental surgeon to diagnose, analyze and treat common orthodontic problems by preventive, interceptive and corrective orthodontic procedures

b) COURSE CONTENT

The undergraduate study of orthodontics spans over second year, third year and fourth year. In second year the emphasis is given for basic and preclinical wire bending exercises and appliance fabrication. In third year the student has to undergo clinical postings where patient care and appliance management is emphasized. In fourth year of study the candidate will be allotted with long cases for detailed discussion treatment plan formulation appliance construction, insertion and management. In addition they will be trained to attend routine out patients, appliance activation, cephalometric interpretation etc.

c) SKILLS

i. To diagnose a case of malocclusion and formulate a treatment plan
ii. To make a good alginate impression
iii. To fabricate a good study model
iv. To perform various model analysis and cephalometric analysis
v. To construct routine removable and myofunctional appliances using cold cure acrylic
vi. Insertion and management of appliance

d) INTEGRATION

By learning the science of Orthodontics, the student should be able to diagnose different types of malocclusion, develop a treatment plan and manage simple malocclusions. The student should acquire skills to recognize Complex malocclusions and the same may be referred to a specialist.

This insight is gained in a variety of ways:

i. Pre clinical training
ii. Lectures & small group teaching
iii. Demonstrations
iv. Spot diagnosis and discussions
v. Long case discussions
vi. Seminar presentations

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e) AN OUTLINE OF THE COURSE CONTENT:

Study of clinical Orthodontics to enable the student to understand the science and art of orthodontics

f) THEORY: 70 Hours (III yr. 20hrs, Final yr. Part. I. 50 Hrs)

Sl no	Topics for III year	Hours
1	Introduction definition historical background aims and objectives of orthodontics and need for orthodontic care	1
2	Growth and development –General principles. Definition, growth spurts and differential growth, factors influencing growth and development, methods of measuring growth, Growth theories (Genetic, Sicher's, Scott's, Moss's, Petrovic's, Multifactorial) 1.Genetic and epigenetic factors in growth 2. Cephalocaudal gradient in growth. 3.Morphologic Development Of Craniofacial Structures a. Methods of bone growth b. Prenatal growth of craniofacial structures c. Postnatal growth and development of: cranial base, maxilla, mandible, dental arches and occlusion. 4. Functional Development of Dental Arches and Occlusion a. Factors influencing functional development of dental arches and occlusion. b. Forces of occlusion c. Wolfe's law of transformation of bone d. Trajectories of forces 5. Clinical Application Of Growth And Development Normal And Abnormal Function Of Stomatognathic System	7
3	Occlusion and Malocclusion in general a. Concept of normal occlusion b.. Definition of malocclusion c. Description of different types of dental, skeletal and functional malocclusion. Classification of Malocclusion	4

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	Principle, description, advantages and disadvantages of classification of malocclusion by Angle's, Simon's, Lischer's and Ackerman and Proffitt's.	
4	Etiology of malocclusion a. Definition, importance, classification, local and general etiological factors. b.. Etiology of various types of malocclusion.	2
5	Diagnosis And Diagnostic Aids a. Definition, Importance and classification of diagnostic aids b. Importance of case history and clinical examination in orthodontics c. Study Models: - Importance and uses - Preparation and preservation of study models d. Importance of intraoral X-rays in orthodontics e. Panoramic radiographs: - Principles, Advantages, disadvantages and uses f) Cephalometrics: Its advantages, disadvantages 1. Definition 2. Description and use of cephalostat 3. Description and uses of anatomical landmarks lines and angles used in Cephalometric analysis 4. Analysis- Steiner's, Down's, Tweed's, Witts, Ricket's-E- line g. Electromyography and its uses in orthodontics h. Wrist X-rays and its importance in orthodontics	5
	Topics for Final year (Part I)	
1	Preventive orthodontics Definition and Different procedures undertaken in preventive orthodontics and their limitations	2
2	Interceptive orthodontics a. Definition b. Different procedures undertaken in interceptive orthodontics c. Serial extractions: Definition, indications, contra-indication, technique, advantages and disadvantages. d. Role of muscle exercises as an interceptive procedure	3
3	General principles in orthodontic treatment planning	2

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4	Anchorage Anchorage in Orthodontics - Definition, Classification, Types and Stability Of Anchorage	2
5	Biomechanical principles in orthodontic Tooth Movement a. Different types of tooth movements b. Age factor in orthodontic tooth movement	2
6	Biology of tooth movement Tissue response to orthodontic force application	2
7	Methods of gaining space Proximal stripping Extractions Expansions Distalisation Proclination of anteriors and de-rotation of posteriors	7
8	Orthodontic appliances – general Indications, classifications, advantages and disadvantages	2
9	Removable orthodontic appliances Components, indications, advantages and disadvantages	2
10	Fixed orthodontic appliances Historical development, various systems, components, advantages disadvantages.	2
11	Myo functional appliances Definition, classification, various appliances like activator, Frankel, Twinblock, bionator and fixed functional appliances	5
12	Orthopaedic appliances Head gear, face mask and chin cap	3
13	Cleft lip and palate – orthodontic management	2
14	Surgical orthodontics – general Minor surgical procedures Major surgical procedures Surgical decompensation	3
15	Principles of management of various malocclusions Deep bite, open bite, cross bites, midline diastema, class I, II and III malocclusion	3

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16	Adult orthodontics	2
17	Retention and relapse Schools of thought, theorems of retention, various fixed and removable retainers	2
18	Computers and recent developments in orthodontics	2
19	Genetics	1
20	Ethics	1
21	Miscellaneous topics a) Soldering and welding b) Sterilization c) Laboratory procedures.	1

g) CLINICAL TRAINING

Sl no	Training In III year	Hours
1	Model analysis • Pont's analysis • Ashley Howe's analysis • Carey's analysis • Bolton's analysis • Moyer's mixed dentition analysis	60
2	Cephalometric analysis • Down's analysis • Steiner's analysis • Tweed's analysis • Witts appraisal	
3	Short cases • Impressions • Model fabrication • Wire bending • Acrylization • Trimming and polishing • Insertion of appliance	
	Training In Final year (Part I)	
1	Long case taking • Case taking	**140**

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	• Model analysis • Discussion • Appliance fabrication and insertion	
2	Short cases • Spot diagnosis and spot discussion • Appliance fabrication and insertion	
3	Attending O P cases and appliance review	
4	Desirable exercises Modified Adam's clasp Adams clasp on anterior teeth Split labial bow, reverse labial bow, mills retractor, Roberts retractor, high labial bow with aprons spring	

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h) SCHEME OF EXAMINATION

Distribution of Topics and Types of Questions for University Written Examination:

Contents	Types of Questions and Distribution of Marks	Total Marks
Growth and development, classification and etiology of malocclusion, diagnostic aids, interceptive orthodontics, anchorage, biomechanics, biology of tooth movement, methods of gaining space, myofunctional appliances, orthopaedic appliances, retention and relapse	Structured Essays 2x 10marks	20
Introduction and historical background, growth and development, occlusion and malocclusion – classification and etiology. Diagnostic aids, skeletal maturity indicators, preventive and interceptive orthodontics, general principles of treatment planning, anchorage, biomechanics, biology of tooth movement, methods of gaining space, orthodontic appliances – removable and fixed appliances, myo-functional and orthopaedic appliances, management of various malocclusions, management of cleft lip and palate, surgical orthodontics, adult orthodontics, retention and relapse, computers in orthodontics, genetics and ethics.	Short Notes 4 x 5marks	20
	Brief Notes 10x3marks	30
	Total	**70**

ix. Theory

University Written **70 Marks**

Viva Voce **20Marks**

Internal Assessment **10 Marks**

x. Clinical:

University Clinical Examination: **80 Marks**

Case Presentation *40Marks*

Impression Making *20 Marks*

Spotters (10 x 1 Marks) 10 Marks

Clinical Work Record/Seminar/Assignment *10 Marks*

Internal Assessment: **20 Marks**

Grand Total 200Marks

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19. ORAL & MAXILLOFACIAL SURGERY

a) AIM

To produce a graduate who is competent in performing extraction of teeth and minor surgeries under both local and general anaesthesia, prevent and manage related complications, acquire knowledge regarding aseptic procedures, have reasonable understanding of management of infectious patients and prevention of cross infections, learn about BLS, acquire a reasonable knowledge and understanding of the various diseases, injuries, infections occurring in the Oral & Maxillofacial region and offer solutions to such of those common conditions and has an exposure in to the in-patient management of maxillofacial problems and also to acquire reasonable knowledge regarding the surgical principals involved in implant placement and be able to communicate properly and understand medico legal responsibilities

b) OBJECTIVES:

i. Knowledge & Understanding

At the end of the course and the clinical training the graduate is expected to –

(1) Able to apply the knowledge gained in the preclinical subjects and related medical subjects like general surgery and general medicine in the management of patients with oral surgical problem.

(2) Able to diagnose, manage and treat (understand the principles of treatment of) patients with oral surgical problems.

(3) Knowledge of range of surgical treatments.

(4) Ability to decide the requirement of a patient to have oral surgical specialist opinion or treatment.

(5) Understand the principles of in-patient management.

(6) Understand the principles of emergency management of maxillofacial injuries, BLS measures and the medico legal responsibilities and formalities.

(7) Understanding of the management of major oral surgical procedures and principles involved in patient management.

(8) Be able to decide the need for medical/ surgical consultations and the method of doing so.

(9) Should know ethical issues and have communication ability.

(10) Should know the common systemic and local diseases, drugs used and drug interactions

(11) Death Certification & legal aspects of forensic medicine

ii. Skills:

A graduate should have acquired the skill to:

(1) Examine any patient with an oral surgical problem in an orderly manner.

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(2) Be able to understand requisition of various clinical and laboratory investigations and is capable of formulating differential diagnosis.

(3) Should be competent in the extraction of teeth under both local and general anesthesia.

(4) Should be able to carry out certain minor oral surgical procedures under L.A. simple impactions, draining of abscesses, simple dental wiring, biopsies etc.

(5) Ability to assess, prevent and manage various complications during and after surgery.

(6) Able to provide primary care and manage medical emergencies in the dental office.

(7) Understanding of the management of major oral surgical problems and principles involved in inpatient management.

(8) Should be competent in measures necessary for homeostasis and wound closures.

c) THEORY: 70 HOURS (III Yr. 26 hrs, Final Yr. Part I. 20 hrs. Part II. 30 hrs.)

Sl. No.	Topics	Description	Hours
	Topics for III Year		
1.	Introduction	Definition, scope, aims and objectives. Diagnosis in oral surgery: History taking, Clinical examination, Investigations. Principles of infection control and cross-infection control with particular reference to HIV/AIDS and Hepatitis.	**1**
2.	Principles of Oral Surgery	1) Asepsis: Definition Measures to prevent introduction of infection during Surgery. Preparation of the patient, Measures to be taken by operator, Sterilization of instruments - various methods of sterilization etc, Principles and need for cleaning of infected/ used instruments prior to re sterilization Surgery set up. 2) Painless Surgery:	**4**

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		Pre- anesthetic considerations Pre-medication: purpose, drugs used Anesthetic considerations a) Local b) Local with IV sedations Use of general anesthetic 3) Access: Intra-oral: Mucoperiosteal flaps, principles, commonly used intraoral incisions. Bone Removal: Methods of bone removal. Use of Burs: Advantages & precautions Bone cutting instruments: Principles of using chisel & osteotome. Extra-oral. Skin *incisions - principles, various extra-oral incision to expose facial* skeleton. a) Submandibular b) Pre auricular Incision for TMJ, Access to maxilla & orbit , Bi coronal incision 4) Control of hemorrhage during surgery Normal Haemostasis Local measures available to control bleeding Hypotensive anaesthesia etc. 5) Drainage & Debridement Purpose of drainage in surgical wounds Types of drains used Debridement: purpose, soft tissue & bone debridement. 6) Closure of wounds Type wounds, Classification of wounds Suturing: Principles Suture material: Classification, ideal requirements Body response and resorbability of	

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		various materials etc. 7) Post operative care Post operative instructions Physiology of cold and heat in the control of pain and swelling Analgesics and anti-inflammatory drugs in the control of pain and swelling Control of infection – antibiotics, principles of antibiotic therapy, prevention of antibiotic abuse Long term post operative follow up - significance.	
3.	Local Anaesthesia	Introduction and Neurophysiology Concept of LA Classification of local anesthetic agents Ideal requirements, Mechanism of action, Armamentarium required Types of local anaesthesia Use of vaso constrictors in local anesthetic solution -Advantages, contra-indications, Various vaso constrictors used. Anaesthesia of the mandible -Pterygomandibular space - boundaries, contents etc. Intra oral and extra oral techniques of Inferior Alveolar Nerve Block, Mandibular Nerve Block, Mental Nerve Block, Infiltrations, etc. Anaesthesia of Maxilla – Infiltrations, Infra - orbital nerve block, Posterior superior alveolar nerve block, Infiltrations, Maxillary nerve block – Intra oral and extra oral Techniques Complications of local anaesthesia- local and systemic Disposal of sharp instruments	**5**

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4.	General Anaesthesia	Concept of general anaesthesia. Indications of general anaesthesia in dentistry. Pre-anesthetic evaluation of the patient. Pre-anesthetic medication - advantages, drugs used. Conscious sedation Commonly used anesthetic *agents.* Complication during and after G.A. I.V. sedation with Diazepam and Midazolam. Indications, mode of action, technique etc. Cardiopulmonary resuscitation Use of oxygen and emergency drugs. Tracheostomy.	**2**
5.	Exodontia	General considerations Ideal Extraction. Indications/ contra indications for extraction of teeth Extractions in medically compromised patients. Methods of extraction Forceps or intra-alveolar or closed method. Principles, types of movement, force, role of left hand etc. Trans-alveolar, surgical or open method Indications, surgical procedure. Dental elevators, uses, classification, principles in the use of elevators, commonly used elevators. Armamentarium, Complications Complications during exodontia Common to both maxilla and mandible. Post-operative complications Prevention and management of complications.	**4**
6.	Medical Emergencies in dental practice	Primary care of medical emergencies in dental practice (a) Cardio vascular (b) Respiratory (c) Endocrine	**3**

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		(d) Anaphylactic reaction (e) Epilepsy Basic Life Support	
7.	Emergency drugs & Intra muscular and I.V. Injections	Emergency drugs required in a dental clinic Applied anatomy. Sites for intra muscular and intra venous injections, techniques etc.	**1**
8.	Death Certification & legal aspects of Forensic medicine.(*classes to be handled by faculty from the department of forensic medicine of a recognized medical college)**	Legal procedure and courts	**1**
		Medicolegal Autopsy, Objective, Procedure - Exhumation	**2**
		Sudden and unexpected death	**1**
		Forensic traumatology -Mechanical injuries, Medicolegal aspect of injury, Head injury, Transportation injuries	**1**
		Dental investigation in mass disaster incidents	**1**
		Topics for Final year (Part I)	
9.	Impacted teeth	i. Incidence, definition, etiology. ii. Impacted mandibular third molar Classification, reasons for removal Assessment - both clinical & radiological. Armamentarium and surgical procedures for removal. Complications during and after removal, its prevention and management. iii. Maxillary third molar, Indications for removal, classification, Armamentarium and surgical procedure for removal, Complications during and after removal, its prevention and management. iv. Impacted maxillary canine. Reasons for canine impaction, indications for removal, Methods of management, Localization, labial and palatal approaches, Complications during and	**4**

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		after removal, its prevention and management Surgical exposure,Transplantation	
10.	Neurological Diseases	i. Trigeminal neuralgia - definition, etiology, clinical features and methods of management including medical and surgical. ii. Facial paralysis - etiology, clinical features. iii. Nerve injuries - Classification, clinical features and management, Nerve Grafting -Neuropathy etc.	**3**
11.	Implants	Concept of osseointegration, History of implants their design & surface characteristics. Knowledge of various types of implants, Bone biology, Morphology, Classification of bone and its relevance to implant placement. Bone augmentation materials. Soft tissue considerations in implant dentistry. Surgical procedure to place implants.	**2**
12.	Diseases of the maxillary sinus	Surgical anatomy and development of the sinus. Sinusitis both acute and chronic Surgical approach of sinus - Cald well-Luc procedure, Knowledge of FESS, Removal of root from the sinus. Oro-antral fistula and communications- etiology, clinical features and surgical methods for closure.	**2**
13.	Cysts of the mouth and jaws	Definition, classification, pathogenesis. Diagnosis - Clinical features, radiological, FNAC, use of contrast media and histopathology. Management - types of surgical procedures. Rationale of the techniques, indications, contraindications, procedures, complications etc.	**4**
14.	Jaw deformities	Basic forms - Prognathism, Retrognathism and open bite. Reasons for correction.	**3**

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		Diagnosis and treatment planning Outline of surgical methods carried out on mandible and maxilla-subapical, body,sagittal split osteotomy, genioplasty, anterior maxillary Osteotomy, Le fort I osteotomy Role of distraction osteogenesis in correction of jaw deformities	
15.	Pre-prosthetic Surgery	Definition Classification of procedures Corrective procedures: Alveoloplasty, Reduction of maxillary tuberosities, Frenectemies and removal of tori. Ridge extension or Sulcus extension procedures, Indications and various surgical procedures Ridge augmentation and reconstruction. Indications, use of bone grafts, hydroxyapatite etc	**2**
	Topics for Final year (Part II)		
16.	Cleft Lip and Palate	Etiology of the clefts, incidence, classification Role of dental surgeon/ maxillofacial surgeon in the cleft team. Outline of the closure procedures,	**1**
17.	Infections of the Oral cavity	Introduction, surgical anatomy of the superficial and deep fasciae of head and neck Factors responsible for infection, pathogenecity, virulence Dento-alveolar abscess - aetiology, clinical features and management. Spread of odontogenic infections through various facial spaces and its management Ludwig's angina - definition, aetiology, clinical features, management and complications Course of odontogenic infections	**6**
18.	Fungal Infections of head and neck	Candidiasis, Actinomycosis, Coccidiodmycosis, Rhinosporidosis,	**1**

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	region	Antifungal agents	
19.	Osteomyelitis of the jaws	Definition, etiology, pre-disposing factors, classification, clinical features and management.	**1**
20.	Carcinoma of the oral cavity	Lymphatic Spread. TNM classification, Staging. Biopsy-types, filling of Histopathology request form Outline of management of Squamous Cell Carcinoma: surgery, radiation and chemotherapy Role of dental surgeons in the prevention and early detection of oral cancer.	**2**
21.	Osteoradionecrosis -	Definition, etiology, theories, pre-disposing factors, classification, clinical features and management.	**1**
22.	Maxillofacial Traumatology	Emergency management in maxillofacial trauma General considerations, types of fractures, aetiology, clinical features and general principles of management. Mandibular fractures - Applied anatomy, classification. Diagnosis - Clinical and radiological features, Management - Reduction -closed and open Fixation and immobilization methods outline of rigid and semi-rigid internal fixation Fractures of the condyle - etiology, classification, clinical features, principles of management Fractures of the middle third of the face. Definition of the mid face, applied surgical anatomy, classification, clinical features and outline of management. Alveolar fractures - methods of management Fractures of the Zygomatic complex and orbit. Classification, clinical features, indications for treatment, various methods of reduction and fixation	**7**

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		Faciomaxillary Injuries in Children Complications of fractures - delayed union, non-union and malunion.	
23.	Salivary gland diseases	Surgical Anatomy of Minor and Major salivary glands Sialography, contrast media, procedure. Inflammatory conditions of the salivary glands Sialolithiasis- Sub mandibular duct and gland , parotid duct and gland ,Clinical features, management, Intraoral and extra oral Sialolithotomy. Salivary fistulae, sialocoele Autoimmune diseases of the salivary glands, diagnosis management Common tumours of salivary glands like Pleomorphic adenoma including minor salivary glands.	**3**
24.	Tumors of the Oral cavity	General considerations, surgical principles Non odontogenic benign tumours occurring in oral cavity - fibroma, papilloma, lipoma, ossifying fibroma, myxoma etc. Odontogenic tumors: both benign and malignant. Ameloblastoma - Clinical features, radiological appearance and methods of management. Osteogenic tumours of the faciomaxiliary region.	**4**
25.	Disorders of T.M. Joint	Applied surgical anatomy of the joint. Development of the TMJ Surgical approaches to TM.J Radiological investigations Hypermobilty of TMJ; Dislocation - Types, aetiology, clinical features and management. Hypomobility of TMJ; Classification, Ankylosis - Definition, aetiology, clinical features and management	**4**

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		Myo-facial pain dysfunction syndrome, etiology, clinical features, management- Non surgical and surgical. Internal derangement of the joint. Inflammatory Diseases of T.M. Joint. Arthroscopy	

d) CLINICAL AND ACADEMIC REQUIREMENTS

i. Case Taking: Detailed clinical examinations, investigations and diagnosis – 10 nos.
ii. Dental extractions under local anesthesia – 180 nos.
iii. Suturing of extraction wound -5 nos.
iv. Incision and drainage – 3 nos.
v. Arch bar wiring, eyelet wiring and intermaxillary fixation on plaster or acrylic models- 1 each
vi. IV/ IM injection technique on patients- 5 nos. each
vii. Wound dressing – 5 nos.
viii. Observing minor surgery done by staff member- 5 nos.
ix. Surgical Assistance of minor surgeries- 5 nos.
x. Observation of major surgeries in Operation Theatre- 3 nos.
xi. Observation of surgical procedures performed in casualty– 5 nos.
xii. Training in handling medical emergencies. CPR and basic life support
xiii. Seminars: 6 nos. Two in the third year, Two in the fourth year and Two in the final year

A work record should be maintained by all students detailing each of the clinical and academic requirements duly signed by the teacher in charge and should be submitted at the time of examination after due certification from the head of the department.

e) CLINICAL REQUIREMENTS YEAR WISE SPILT UP:

Sl. No.	Topic	Procedures in III Year	Quota: Must do
1	Case Taking	Detailed clinical examinations, investigations and diagnosis	2 cases
2	Dental Extraction	Extraction of anterior and mobile teeth under LA : Infiltration only	30 cases
3	Seminars	Seminars on basic subjects, local anesthesia, investigative procedures,	2 no.

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		exodontia etc	
	Injection	IV/ IM injection technique on patients-	5nos.each
4	Observation	Observing minor surgery under LA done by staff member	2 cases
Procedures in Final year (Part I)			
1	Case Taking	Detailed clinical examinations, investigations and diagnosis	3 cases
2	Dental Extraction	Extraction of anterior and posterior teeth under LA : Infiltration and blocks	90 cases
3	Suturing	Suturing of extraction wound	5 no.
4	Seminars	Seminars on oral surgery subjects, cross contamination and infection, impactions, medically compromised patients, medical emergencies etc.	2 no.
5	Observation	Observing minor surgery under LA done by staff member	3 cases
6	Assistance	Assistance of minor surgery under LA done by staff member	2 cases
7	Observation	Observation of cases managed in the casualty	2 cases
8	Skill development	Wiring procedures in models	3 nos.
Procedures in Final year (Part II)			
1	Case Taking	Detailed clinical examinations, investigations and diagnosis	5 cases
2	Dental Extraction	Extraction of anterior and posterior teeth under LA : Infiltration and blocks	60cases
3	Seminars	Seminars on oral surgery subjects like TMJ, Tumors, Maxillofacial injuries, Infections, Salivary Gland diseases and Medico-legal cosiderations	2 no.
4	Observation	Observation of major surgery under GA do in the OT	3 cases
5	Assistance	Assistance of minor surgery under LA done	3cases

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		by staff member	
6	Procedure	Incision and drainage	3
7	Procedure	Wound dressing	5
8	Observation	Observation of cases managed in the casualty	3 cases

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f) SCHEME OF EXAMINATION

Distribution of Topics and Types of Questions for University Written Examination:

Contents	Types of Questions and Distribution of Marks	Total Marks
One Question from Local Anaesthesia One Question from Oral Surgery	Structured Essays 2x 10marks	20
Two Questions from Oral Surgery, One Question from Local Anaesthesia, , One Question from General Anaesthesia	Short Notes 4 x 5marks	20
Questions from any of the Oral & Maxillofacial Surgery topics.(at least one question from management of medical emergencies) One question from Death Certification & legal aspects of Forensic medicine.	Brief Notes 10x3marks	30
	Total	**70**

xi. Theory

University Written **70Marks**

Viva Voce **20Marks**

Internal Assessment **10 Marks**

xii. Clinical:

University Clinical Examination: **80 Marks**

Extraction of one firm tooth (Maxillary/ Mandibular)

Case History	*20 Marks*
Local Anaesthesia technique	*25 Marks*
Extraction of firm tooth & patient management	25 Marks
Clinical Work Record & Seminar	*10 Marks*

Internal Assessment: **20 Marks**

Grand Total 200Marks

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20. CONSERVATIVE DENTISTRY AND ENDODONTICS

a) OBJECTIVES:

i. Knowledge and Under Standing:

The graduate should acquire the following knowledge during the period of training,

(1) To diagnose and treat simple restorative work for teeth.

(2) To gain knowledge about aesthetic restorative material and to translate the same to patients needs.

(3) To gain the knowledge about endodontic treatment on the basis of scientific foundation.

(4) To carry out simple endodontic treatment.

(5) To carry out simple luxation of tooth and its treatment and to provide emergency endodontic treatment.

ii. **Skills:**

He should attain following skills necessary for practice of dentistry

(1) To use medium and high speed hand pieces to carry out restorative work.

(2) Poses the skills to use and familiarize endodontic instruments and materials needed for carrying out simple endodontic treatment.

(3) To achieve the skills to translate patients esthetic needs along with function.

iii. Attitudes:

(1) Maintain a high standard of professional ethics &conduct and apply these in all aspects of professional life.

(2) Willingness to participate in CDE programme to update the knowledge and professional skill from time to time.

(3) To help and participate in the implementation of the national oral health policy.

(4) He should be able to motivate the patient for proper dental treatment and maintenance of oral hygiene should be emphasise which will help to maintain the restorative work and prevent future damage.

b) THEORY: 160 HOURS (II yr.25hrs, III Yr. 65 hrs, Final Yr. Part I. 40 hrs. Part II. 30hrs.)

Sl.No.	Topic for II Year	Hours
1.	Introduction to Conservative Dentistry.	1
2.	Definition, Aim & Scope of Conservative Dentistry & Endodontics	
3.	Nomenclature of dentition; Tooth Numbering systems	1
4.	Restoration - Definition & Objectives	

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5.	Hand Instruments - Classification, Nomenclature, Design, Formula of hand cutting instruments, Grasps and Rests, Sterilization.	2
6.	Rotary Cutting instruments - Burs, Design, Types. Various speeds in tooth preparation. Hazards with cutting instruments.	2
7.	Dental caries – Aetiology, classification, caries terminology	1
8.	Fundamentals in Tooth preparation	4
9.	Definition, Stages and steps , Classification of Tooth preparations, Nomenclature, Concepts in tooth preparations for Silver Amalgam, Cast gold inlay, Composite resins and Glass Ionomer	
10.	Tooth preparation for amalgam restorations. Stepwise procedure for Class I, II, III, IV, V amalgam restorations. Failure of amalgam restoration.	6
11.	Contact and contour of teeth – different methods of tooth separation	1
12.	Matrices, Retainers, Wedges – methods of wedging	1
13.	Finishing & polishing of restorations.	1
14.	Chair side positions – patient and operator positions	1
15.	Management of deep carious lesions – Technique of caries excavation with hand and rotary instruments, Affected and Infected dentin, Caries detector dyes, Concept of Remaining Dentin Thickness, Pulp capping and Pulpotomy.	2
16.	Access cavity and brief introduction of root canal instruments	2
	Topic for III Year	
17.	**Nomenclature of Dentition** Tooth numbering systems: ADA, Zsigmondy- Palmer, and FDI systems	2
18.	**Gnathological concepts of Restoration** Physiology of occlusion, normal occlusion, ideal occlusion mandibular movements and occlusal analysis. Occlusal rehabilitation and restoration.	3
19.	**Dental Caries** Aetiology, classification clinical features, morphological features, microscopic features, clinical diagnosis and sequel of dental caries. Caries treatment.	6
20.	**Treatment Planning For Restorative Procedure**: Patient assessment, clinical examination, radiographic examination, tooth vitality tests, diagnosis and treatment planning, preparation of the case sheet. Patient and operator position.	3
21.	**Preventive measures in restorative practice** Plaque control, Pit and Fissure sealants, Fluorides, Dietary measures, restorative	4

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	procedures and periodontal health.	
22.	**Armamentarium for Tooth Preparation**: General classification of operative instruments. a) Hand cutting instruments Terminology and classification Design, formula and sharpening of instruments. Grasp Rest and application. b) Rotary cutting instruments Dental bur , mechanism of cutting Common design characteristics Diamond and other abrasive instruments Cutting mechanism Hazards and precautions Sterilization and maintenance of instruments. Basic Instrument tray set up.	6
23.	**Isolation of Operating Filed**: Control of moisture ,purpose and methods of isolation, rubber dam isolation in detail, antisialogogues	3
24.	**Infection Control** Routes of transmission of dental infection Personal barrier protection Control of infection from aerosol, spatter Sterilization procedures for dental equipment and instruments, monitoring sterilization, disinfection of operatory Dental water line contamination and Biofilm Disposal of waste	4
25.	**Pulp Protection** Liners, Varnishes, Bases. Affected and infected dentin, Caries detector dyes Concepts of Remaining Dentin Thickness	3
26.	**Pain control in restorative procedures**	3
27.	**Amalgam Restoration**: Indication, contraindication. Physical and mechanical properties	7

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	Clinical behavior. Advantages and disadvantages. Tooth preparation for Class I , II, V and III. Step wise procedure for tooth preparation and restoration including modified designs. Bonded amalgam, Failure and repair of amalgam restorations	
28.	**Contacts and contour** Tooth separation Matrices, retainers and wedges, methods of wedging	1
29.	**Management Of Deep Carious Lesions** Technique of caries excavation – Hand and rotary Indirect and Direct Pulp Capping, Pulpotomy	1
30.	**Dentinal Hypersensitivity** Theories of hypersensitivity Management	1
31.	**Complex amalgam restorations** Pin Amalgam Restoration Indications, Contra Indication, Advantages, Disadvantages of pin amalgams, types of pins, methods of placement, alternative means for providing retention for complex amalgam restorations. Failure of pin amalgam restoration	4
32.	**Gingival Tissue Management** Indication and methods, including recent techniques for gingival retraction.	2
33.	**Adhesion to tooth structure** Definition and mechanism Enamel and Dentin bonding Classification and recent development in dentin bonding systems components of dentin bonding agents critical steps in dentin bonding.	3
34.	**Anterior Restorations** Selection of cases, selection of material, shade selection, Clinical technique for anterior composite restorations.	2
35.	**Composite Restorations** Composition, classification, properties Recent advances in composite resins Indications, contraindications, advantages, disadvantages	4

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	Step wise procedures of tooth preparation for composite restorations. Finishing and polishing of composite restoration	
36.	**Minimal Invasive Dentistry** Principles of MID, caries risk assessment, materials and techniques	2
37.	**Alternate methods of tooth preparation for restorations** Air abrasion, chemo mechanical method, lasers	1
	Topic for Final year (Part I) **Endodontics**	
38.	**Introduction, definition, scope and future of Endodontics**	1
39.	**Rationale and principles of Endodontics** Case selection, indication and contraindications for root canal treatments	2
40.	**Clinical diagnostic methods** Case history, diagnosis and treatment plan Clinical diagnostic methods Case history, diagnosis, pulp vitality assessment, recent advances and treatment plan	3
41.	**Microbiology of endodontic infection**	2
42.	**Isolation and infection control in Endodontics** Rubber dam application	1
43.	**Endodontic instruments** Hand instruments Power driven instruments Standardization Principles of using endodontic instruments Sterilization	3
44.	**Pulpal diseases** Classification, etiology, diagnosis, management	2
45.	**Periapical diseases**: Classification, etiology, diagnosis, management	2
46.	**Vital pulp therapy**: Indirect and direct pulp capping Pulpotomy - types and medicaments used Apexogenesis and apexification –multivisit and single visit apical barrier techniques, revascularization ,regenerative endodontics	3

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47.	**Esthetics in dentistry** Introduction and scope Facial proportions, Golden proportions Anatomy and physiology of smile Role of colour and translucency Esthetic recontouring Alteration of tooth form, shape, size and colour Management of discoloured teeth	4
48.	**Composite restorations** Recent advances in posterior composite resins Indications, contraindications, advantages and disadvantages Stepwise procedure of tooth preparation for composite restoration. Clinical technique for posterior direct composite restorations Finishing and polishing of composite restoration Indirect posterior composite restoration	4
49.	**Casts restorations** Indications, contraindications, advantage and disadvantages Materials used Class II cavity preparation for inlays Types of bevels in cast restoration Fabrication of wax patterns Differences in tooth preparation for amalgam and cast restorations	3
50.	**Casting** Die materials and preparation of dies Refractory materials Alloys used for casting Casting machines Casting procedure Casting defects Cementation of restoration	2
51.	**Temporisation or interim restoration** Materials and procedure	1
52.	**Root Caries** Etiology, clinical features and management	1

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53.	**Non carious destruction of tooth structure** Definition, etiology, diagnosis, clinical features and management	2
54.	**Ceramic Restorations** Recent advances in ceramic materials & techniques including CADCAM (in brief) Ceramic laminates, inlays, onlays and crowns, Indications, contraindications, advantages, disadvantages and techniques (in brief)	3
55.	**Direct Filling gold Restorations** Introduction Types of direct filling gold Indications, contraindications, advantages, disadvantages tooth preparation and restoration	1
	Final year (Part II)	
	Endodontics	
56.	**Emergency endodontic procedures**	2
57.	**Anatomy of pulp space** Root canal anatomy of maxillary and Mandibular teeth. Classification of canal configuration and variations in pulp space.	2
58.	**Access preparation** Objectives Principles Instruments used Sequential steps of access preparation for individual tooth	2
59.	**Preparation of root canal space** a. Determination of working length definition and methods of determining working length	1
	Cleaning and shaping of root canals Objectives Principles Instruments used Techniques – hand and rotary Step back & Crown down methods	2

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60.	**Disinfection of root canal space** a. Irrigants Functions Requirements Types Methods and techniques of irrigation	1
	b. Intracanal medicaments Functions Requirements Types Method of placement and limitations	1
61.	**Problems during cleaning and shaping of root canal spaces** Perforation and its management Broken instruments and its management Management of curved root canals	2
62.	**Obturation of the root canal system** a. Materials- Ideal root canal filling material, classification of materials b. Obturation techniques Classification and procedure	2
63.	**Root canal sealers** Ideal properties Classification, functions Manipulation and application of root canal sealers	2
64.	**Post endodontic restoration** Principles of post endodontic restorations Post and core-materials and procedure(in brief)	2
65.	**Smear layer and its importance in endodontics and conservative treatment**	1
66.	**Discoloured teeth and its management** Classification, etiology Bleaching agents , Vital and non vital bleaching methods	1
67.	**Traumatized teeth** Diagnosis, Classification ,management of of luxated ,avulsed teeth .root fracture,	2

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	vertical fracture	
68.	**Endodontic surgeries** Indication contraindications, pre operative preparation Surgical instruments and techniques Apicoectomy, retrograde filling Post operative sequale Trephination, hemisection Radisectomy Reimplantation (both intentional and accidental)	3
69.	Endo-perio lesions Portals of communication Etiology ,clinical features, diagnosis, classification and management	
70.	**Root resorption** Etiology and management	1
71.	**Success and failures of endodontic treatments**	1
72.	**Retreatment in Endodontics**	1
73.	**Specialized equipments-lasers, magnification loupes, dental operating microscopes(DOM) in conservative dentistry and endodontics**	1

c) Minimum requirement to appear for Final BDS Part II Conservative Dentistry and Endodontics University Examination:

Sl.No	Clinical Procedure	No.
1	Case history recording, diagnosis and treatment planning	10
2	Management of deep caries lesions	5
3.	Glass ionomer restorations	20
4.	Composite restorations in anterior teeth	5
5.	Class I amalgam restorations	30
6.	Class II amalgam restorations	20
7.	Root canal treatment of anterior teeth	5

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d) SCHEME OF EXAMINATION

Distribution of Topics and Types of Questions for University Written Examination:

Contents	Types of Questions and Distribution of Marks	Total Marks
One Question from Conservative Topics One Question from Endodontic Topics	Structured Essays 2x 10marks	20
Two Questions from Conservative Topics including esthetics and Two Questions from Endodontic Topics	Short Notes 4 x 5marks	20
Questions from any of the Conservative & Endodontic topics.	Brief Notes 10x3marks	30
	Total	**70**

xiii. Theory

University Written **70Marks**

Viva Voce **20 Marks**

Internal Assessment **10 Marks**

xiv. Clinical:

University Clinical Examination: **80 Marks**

Internal Assessment: **20 Marks**

Grand Total 200 Marks

Details of Mark distribution for university Practical examination:

Clinical Exercise: 70 marks

Work Record : 10 marks

Clinical Exercises

1. Preparation for class II amalgam and restoration

   Or

2. Anterior composite restoration

   Or

3. Root canal treatment for anterior tooth up to selection of master cone

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Mark distribution for the clinical examinations

1. **Class II amalgam restoration**

i) Case history recording, examination,
diagnosis and treatment planning : 15 min 10 marks
ii) Tooth preparation : 45 min 20 marks
iii) Base and matrix : 15 min 15 marks
iv) Restoration and carving : 30 min 25 marks

Total : 70 marks

2. **Anterior composite restoration**

i) Case history recording, examination,
diagnosis and treatment planning : 15 min 10 marks
ii) Tooth preparation : 30 min 25 mark
iii) Lining and matrix : 15 min 10 marks
iv) Restoration and finishing : 45 min 25 marks

Total : 70 marks

3. **Anterior RCT**

i) Case history recording, examination,
Diagnosis and treatment planning : 15 min 10 marks
ii) Access preparation : 30 min 25 marks
iii) Working length : 15 min 10 marks
iv) Cleaning and shaping,
Master cone selection : 45 min 25 marks

Total : 70 marks

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21. PROSTHODONTICS AND CROWN & BRIDGE

a) THEORY:160 HOURS (IIyr. 25 hrs, IIIyr.65 hrs, Part I.40 hrs, Part II. 30 hrs)

Sl. No.	Topic	Description	Hours
Removable Complete Prosthodontics			
1.	Applied Anatomy and Physiology	Introduction Biomechanics of the edentulous state. Residual ridge resorption	3
2.	Communicating with the patient	Understanding the patients, mental attitude. Instructing the patient.	1
3.	Diagnosis and treatment planning for patient.	With some teeth remaining. With no teeth remaining. Systemic status. Local factor. The geriatric patient Diagnostic procedures.	2
4.	Articulators – discussion		3
5.	Improving the patient's denture foundation and ridge relation- an overview	Pre-operative examination. Initial hard tissue & soft tissue procedure, Secondary hard & soft tissue procedure Implant procedure. Congenital deformities Postoperative procedure	3
6.	Principles of Retention, Support and Stability		2
7.	Impressions- detail.	Muscles of facial expression. Biologic considerations for maxillary and Mandibular impression including anatomy landmarks and their	7

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		interpretation. Impression objectives Impression Materials Impression techniques. Maxillary and Mandibular impression procedures Preliminary impressions Final impressions. Laboratory procedures involved with impression making (Beading & Boxing, and cast preparation).	
8.	Record bases and occlusion rims- in details.	Materials & techniques Useful guidelines and ideal parameters.	2
9.	Recording and transferring bases and occlusal rims		1
10	Biological consideration in jaw relation& jaw movements – craniomandibular relations.	Mandibular movements. Maxillo- Mandibular relation including vertical and horizontal jaw relations.	3
11	Concepts of occlusion- discuss in brief.	Discuss in brief.	2
12.	Relating the patient to the articulator	Face bow types & uses – discuss in brief. Face bow transfer procedure- discus in brief.	1
13.	Recording Maxillo Mandibular relation.	Vertical relation Centric relation records. Eccentric relation records. Lateral relation records	4
14.	Tooth selection and arrangement.	Anterior teeth. Posterior teeth. Esthetic and functional	2

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		harmony.	
15.	Relating inclination of teeth to concept of occlusion- in brief.	Neutrocentric concept. Balanced occlusal concept.	2
16.	Trial dentures		3
17.	Laboratory procedures	Wax contouring. Investing of dentures. Preparing of mold. Preparing & packing acrylic resin. Processing of dentures. Recovery of dentures. Lab remount procedures Recovering the complete denture from the cast. Finishing and polishing the complete denture. Plaster cast for clinical denture remount procedure	3
18.	Denture insertion	Insertion procedures. Clinical errors. Correcting occlusal disharmony. Selective grinding procedures	3
19.	Treating problems with associated denture use	Discuss in brief (tabulation/ flow chart form).	1
20	Treating abused tissues	Discuss in brief	1
21	Relining and rebasing of dentures	Discuss in brief	2
22	Immediate complete dentures construction procedure	Discuss in brief	2
23	The single complete dentures	Discuss in brief	2
24	Overdentures	Discuss in brief	2
25	Implant Supported complete denture	Discuss in brief	3
26	Reduction of residual ridge	Discuss in brief	1
Removable Partial Prosthodontics			

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1.	Introduction		1
2	Terminologies and scope		1
3	Classification		2
4	Examination, Diagnosis & Treatment planning & evaluation of diagnostic data.		2
5	Components of a removable partial denture.	Major connectors Minor connectors Rest and rest seats Direct retainers Indirect retainers Tooth replacement.	12
6.	Principles of Removable Partial Denture Design		3
7	Survey and design – in brief		1
8	Surveyors		1
9	Surveying		1
10	Designing		3
11	Mouth preparation and master cast		1
12	Impression materials and procedures for removable partial dentures		2
13	Preliminary jaw relation and esthetic try in for some anterior replacement teeth		2
14	Laboratory procedures for framework construction- in brief		1
15	Fitting the framework- in brief		1
16	Try in of the partial denture- in brief		1
17	Completion of the partial denture- in brief		1
18	Inserting the Removable partial denture in brief		1
19	Post insertion observations		1
20	Temporary Acrylic Partial Dentures		1
21	Immediate Removable Partial Denture		1
22	Removable partial Dentures opposing Complete denture.		1
Fixed Partial Prosthodontics			
1.	Introduction		1

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2	Fundamentals of occlusion in brief.		1
3	Articulators	In brief.	1
4	Treatment planning for single tooth restoration.		1
5	Treatment planning for the replacement of missing teeth including selection and choice of abutment teeth.		2
6.	Fixed partial denture configurations		1
7	Principles of tooth preparations.		2
8	Preparations for full veneer crowns		3
9	Preparations for partial veneer crowns	In brief.	1
10	Provisional Restorations		1
11	Fluid Control and Soft Tissue Management		1
12	Impressions		1
13	Working Casts and Dies		1
14	Wax patterns		1
15	Pontics and Edentulous Ridges		1
16	Esthetic Considerations		1
17	Finishing and Cementation		1
18	Implant Supported Fixed Restorations		2
Miscellaneous Topics to Be Covered In Brief :			
1	Solder Joints and Other Connectors		35
2	All - Ceramic Restorations		
3	Metal - Ceramic Restorations		
4	Preparations of intracoronal restorations.		
5	Preparations for extensively damaged teeth.		
6	Preparations for Periodontally weakened teeth	`	
7	The Functionally Generated Path Technique		
8	Investing and Casting		
9	Resin - Bonded Fixed Partials Denture		
10	Digital impressions		
11	3D printing in Prosthodontics		
12	CAD-CAM in Prosthodontics		

It is

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suggested that the above mentioned topics be dealt with wherever appropriate in the following order so as to cover -

Definition

Diagnosis (of the particular situation /patient selection /treatment planning)

Types / Classification

Materials

Methodology - Lab /Clinical

Advantages & disadvantages

Indications, contraindications

Maintenance Phase

Recent advances

Failure

b) Mandatory requirement to appear for Final BDS part II Prosthodontics University Examination:

1. *Treating completely edentulous conditions with Complete Denture – Minimum 5 nos. (including all clinical and laboratory procedures)*
2. *Treating partially edentulous conditions with Removable Partial Denture – Minimum 5 nos. (including all clinical and laboratory steps)*
3. *Should have satisfactorily completed all the Preclinical Prosthodontic exercises*
4. *Minimum of one seminar presentation on any Prosthodontic topic. A hard copy of the seminar to be submitted at the time of University examination.*

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c) SCHEME OF EXAMINATION

Distribution of Topics and Types of Questions for University Written Examination:

Contents	Types of Questions and Distribution of Marks	Total Marks
One Question From Complete Denture topics and one from either FPD or RPD	Structured Essays 2x 10marks	20
Two Questions from Complete denture, One question from RPD, One question from FPD.	Short Notes 4 x 5marks	20
Questions from any of the Prosthodontic topics including implants, maxillofacial prosthesis & applied Dental materials	Brief Notes 10x3marks	30
	Total	**70**

xv. Theory

University Written **70 Marks**

Viva Voce **20 Marks**

Internal Assessment **10 Marks**

xvi. Clinical:

University Clinical Examination: **80 Marks**

Case History *5 Marks*

Complete Denture clinical steps *45 Marks*

Tooth Preparation on Typhodont 20 Marks

Clinical Work Record & Seminar *10Marks*

Internal Assessment: **20 Marks**

Grand Total 200Marks

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22. PAEDIATRIC AND PREVENTIVE DENTISTRY

a) THEORY: 65 HOURS (III yr. 15 hrs. Final Yr. Part I. 20hrs Part II*. 30 hrs.)*

Theory topics for III Year		
Sl. No.	**Topic**	**Hours**
	Introduction to Paediatric and Preventive Dentistry Definition, Scope, Objectives and Importance	**1**
1.	Dental Anatomy and Histology ♦ Chronology of Eruption of teeth ♦ Differences between primary and permanent teeth ♦ Eruption disorders and their management including teething, ectopic eruption, ankylosis etc. ♦ Importance of first permanent molar	**1**
2.	Growth and Development (will be covered by Department of Orthodontics also) ♦ Importance of study of growth and development in Pedodontics ♦ Prenatal and postnatal factors in growth and development ♦ Theories of growth and development ♦ Methods to measure growth ♦ Development of maxilla and mandible and age related changes	**2**
3.	Development of occlusion from birth to adolescence ♦ Mouth of neonate, gumpads ♦ Primary Dentition period ♦ Mixed dentition period ♦ Establishment of occlusion ♦ Study of variation and abnormalities	**2**
4.	Case history recording ♦ Principles of history taking, examination, investigations, ♦ diagnosis and treatment planning	**1**
5.	Child Psychology ♦ Definition ♦ Importance of understanding Child Psychology in Pedodontics ♦ Theories ♦ Psychological development from birth through adolescence	**4**

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	♦ Dental fear, anxiety and their management, types of cry ♦ Application of Psychology principles in management of child ♦ patients in the dental office ♦ Psychological disorders including anorexia, bulimia ♦ Child abuse and neglect	
6.	Behaviour management ♦ Definition ♦ Classification and types of behaviour ♦ Factors influencing child behaviour ♦ Non- Pharmacologic management of behaviour ♦ Pharmacologic management of behaviour- ♦ Conscious sedation including nitrous oxide- oxygen inhalational anaesthesia ♦ Pharmacological principles in Paediatric Dentistry- drug dosage formulae ♦ Analgesics, anti-inflammatory and antibiotics commonly prescribed for children	**4**
	Theory topics for Final Year Part I	
7.	Dental Caries ♦ Diagnostic procedures and caries detection ♦ Caries pattern in primary, young permanent and permanent teeth ♦ Early childhood Caries, rampant caries- definition, classification, etiology, pathogenesis, clinical features, complications and management ♦ Role of diet and nutrition in dental caries and sugar substitutes ♦ Diet counselling and diet modifications ♦ Caries activity tests , caries prediction, susceptibility and their clinical application	**3**
8.	Dental Radiology as related to Pedodontics	**1**
1.	Dental materials used commonly in children and adolescents (Outline revision)	**1**
2.	Paediatric Operative Dentistry ♦ Principles of Operative Dentistry ♦ Isolation- Importance and techniques	**5**

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	♦ Young Permanent Teeth and clinical considerations ♦ Modifications in cavity preparation and recent cavity designs for primary and young permanent teeth ♦ Atraumatic / Alternative Restorative Technique (ART) ♦ Other methods of caries removal ♦ Restoration of carious teeth (Primary, young permanent and permanent teeth) using various restorative materials like glass ionomers, composites, silver amalgam ♦ Preformed crowns: Stainless steel, polycarbonate and strip crowns	
3.	Gingival and Periodontal diseases in children ♦ Normal gingival and periodontium in children ♦ Definition, classification ♦ Etiology, Pathogenesis and management of gingival and periodontal condition seen in children and adolescents	**2**
4.	Flourides ♦ Historical background ♦ Systemic fluorides: Availability, agents, concentrations, advantages and disadvantages ♦ Topical fluorides: agents, composition, method of application both for professional and home use, advantages and disadvantages ♦ Mechanism of action and its anticariogenic effect ♦ Fluoride toxicity and its management ♦ Defluoridation techniques	**4**
5.	Paediatric Endodontics ♦ Principles and diagnosis ♦ Classification of pulp pathology ♦ Management of pulpaly involved primary, young permanent and permanent teeth including materials used and techniques followed: ♦ Pulp capping ♦ Pulpotomy ♦ Pulpectomy ♦ Apexogenesis ♦ Apexification	**4**
	Theory topics for Final Year Part II	

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6.	Traumatic injuries to teeth ♦ Definition, classification ♦ Etiology and incidence ♦ Management of trauma to primary teeth ♦ Sequelae and reaction following trauma to primary teeth ♦ Management of trauma to young permanent teeth ♦ Prevention of trauma: mouth protectors	**5**
7.	Preventive Orthodontics ♦ Importance and functions of deciduous dentition ♦ Effects of premature loss of primary teeth Preventive Orthodontics: ♦ Definition ♦ Preventive measures ♦ Space loss ♦ Space maintenance and space management ♦ Space maintainers: definition, classification, indications and contra indications, advantages and disadvantages including construction of fixed space maintainers ♦ Space regainers ♦ Mixed dentition analysis ♦ Serial extraction	**5**
8.	Interceptive Orthodontics ♦ Oral Habits in children ♦ Definition, classification and etiology of all habits ♦ Clinical features of deleterious oral habits including non- nutritive sucking, mouth breathing, non functional grinding, masochistic and occupational habits ♦ Management of oral habits in children ♦ Other problems seen during primary and mixed dentition period and their management	**4**
9.	Dental management of children with special needs ♦ Definition, classification, etiology, clinical features, special considerations in the dental management of :	**5**

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	♦ Physically handicapping conditions ♦ Mentally handicapping conditions ♦ Medically compromising conditions ♦ Genetic disorders and importance of genetic counseling including cleft lip and palate and its management	
10.	Oral surgical procedures in children ♦ Indications and contra indications for extraction ♦ Minor surgical procedures in children ♦ Knowledge of local and general anaesthesia	**2**
11.	Preventive Dentistry ♦ Definition, principles and scope ♦ Levels and types of prevention ♦ Infant oral health care and first dental visit Preventive measures: ♦ Minimal intervention ♦ Pit and fissure sealants ♦ Preventive resin restorations ♦ Newer agents available for caries prevention and demineralization ♦ Caries vaccine	**4**
12.	Nanodentistry – Introduction, principles and technique – an outline	**1**
13.	Dental Health Education and school dental health programmes	**1**
14.	Importance of Dental HOME and anticipatory guidance	**1**
15.	Dental emergencies in children and their management	**1**
16.	Setting up of paediatric dental practice including ethics	**1**

b) PRACTICALS/ CLINICALS

Student is trained to arrive at proper diagnosis by following a scientific and systematic procedure of history taking and examination of orofacial region. Training is also imparted in management whenever possible.

In view of the above each student shall maintain a record of work done, which shall be evaluated for marks at the time of university examination.

The following is the minimum prescribed clinical and academic requirement.

1. Case taking : 25 cases

Long case-

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Detailed history taking & clinical examination, formulating diagnosis and planning comprehensive treatment for the child -**3 nos.**

A very detailed history taking including diet chart recording, space analysis etc - **2nos**.

Short case-

History taking (briefly), clinical examination, formulating diagnosis and treatment planning- **20 nos.**

1. Preventive measures

   Oral prophylaxis after using disclosing agents - **25nos.**

   Topical fluoride application - **25 nos.**

   Pit and fissure sealant application – **2nos**
2. Permanent Restorations:- **45 nos.**
3. Removable orthodontic appliances

   Space maintainers / Habit breakers / Hawley's appliance - **10nos.**
4. Dental Extractions under LA

   Extraction of deciduous and permanent teeth –**30nos.**
5. Special Dentistry

   Treatment for children with special health care needs - **1 no.**
6. Assignments on the topics given below in the year wise split-up
7. Seminar

   Presentation of seminars, preferably in power point, during the Final year Part II clinical posting in the department. Seminar certified by the HOD should be submitted in a book form along with the record at the time of University Practical Examination.-**1 no.**

Clinical requirement –Year wise split up

Sl. No	Topic	Procedures in III year	Minimum requirement
1.	Case taking	Long case- Detailed history taking & clinical examination, formulating diagnosis and planning comprehensive treatment for the child.	2
2.	Preventive measures	1. Oral prophylaxis after using disclosing	5

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		agents 2. Topical fluoride application	5
3.	Permanent Restorations	Amalgam or glass ionomer cement	5
4.	Removable orthodontic appliance	Space maintainer /Habit breaker/Hawley's appliance	1
5.	Dental Extractions	Extraction of mobile deciduous teeth	5
6.	Assignments	Assignments on Milestones of development, Immunisation schedule, Chronology of human dentition & Stages of tooth development, Tooth numbering systems, Eruption sequence, Early and Delayed eruption, Sterilization in dental office, Amalgam-types, composition and setting reaction, GIC- types, composition and setting reaction, Post operative instructions for various clinical procedures- after extractions, restorative work and orthodontic appliance insertion (It should be written in the clinical record and submitted before the end of III year posting in the department)	
7.	A study model/chart/ poster		1
Procedures in Final year (Part I)			
1.	Case taking	Long case- All patient records- clinical & investigative records- like study models, pre-treatment and post- treatment photographs, prints of the radiographs etc Short case- History taking(briefly), clinical examination, formulating diagnosis and treatment planning	1 10
2.	Preventive measures	Oral prophylaxis	15

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		Topical fluoride application	15
3.	Permanent Restorations	Amalgam/GIC	20
4.	Dental Extractions	Extraction of anterior or posterior deciduous teeth under LA	15
5.	Removable orthodontic appliance	Space maintainers/ habit breakers/Hawley's appliance	5
6.	Assignments	Assignments on Dental age and Assessment methods, Topical fluorides, Pulp vitality tests	
Procedures in Final Year (Part II)			
1	Case taking	A very detailed history taking including diet chart recording, space analysis etc Short case -	2 10
2	Preventive measures	Oral prophylaxis Topical fluoride application	5 5
3	Permanent Restorations	Amalgam/GIC	20
4	Removable orthodontic appliances	Space maintainer/Habit breakers/Hawley's appliance	4
5	Dental Extractions	Extraction of teeth including permanent posterior teeth, root stumps, grossly decayed deciduous teeth- under LA	10
6	Treatment for children with special health care needs	Treatment for children with cardiac problem/bleeding disorders/neurological problems/ mentally challenged/visual/ hearing impairment etc	1
7	Seminar	Seminar on allotted topic should be presented with power point and the print and soft copies should be submitted to the Head of the department before the end of Part II posting.	1

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c) SCHEME OF EXAMINATION

Distribution of Topics and Types of Questions for University Written Examination:

Contents	Types of Questions and Distribution of Marks	Total Marks
Questions from any of the Paediatric & Preventive Dentistry Topics	Structured Essays 2x 10marks	20
	Short Notes 4 x 5marks	20
	Brief Notes 10x3marks	30
	Total	**70**

xvii. Theory

University Written **70 Marks**

Viva Voce **20 Marks**

Internal Assessment **10 Marks**

xviii. Clinical:

University Clinical Examination: **80 Marks**

Case History, Clinical Examination, Diagnosis &

Treatment Planning 40 *Marks*

Clinical Procedure:

Oral prophylaxis and topical fluoride application/ 20 Marks

Restoration of decayed tooth/

Extraction of tooth

Chair side preparation & Measures taken for 5 Marks

infection control

Overall management of the

child patient & Post operative instructions *5 Marks*

Clinical Work Record + Seminar + Chart/Poster/Study model 5+3+2=10 *Marks*

Internal Assessment: **20 Marks**

Grand Total 200Marks

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2.7 Total number of Hours (split up)

Subjects	Lecture (hrs)	Practical (hrs)	Clinical (hrs)	Total (hrs)
General Human Anatomy including Embryology and Histology	100	175		275
General Human Physiology	120	60		180
Biochemistry, Nutrition and Dietetics	70	60		130
Dental Anatomy, Embryology and Oral histology	105	250		355
Dental Materials	80	240		320
General and Dental Pharmacology & Therapeutics	70	20		90
General Pathology	55	55		110
General Microbiology	65	50		115
General Medicine	60		90	150
General Surgery	60		90	150
Oral Pathology &Oral Microbiology	145	130		275
Oral Medicine & Radiology	75		200	275
Paediatric & Preventive Dentistry	65		320	385
Orthodontics & Dentofacial Orthopaedics	70	160	200	430
Periodontology	80		200	280
Oral & Maxillofacial Surgery	76		370	446
Conservative Dentistry & Endodontics	160	200	370	730
Prosthodontics and Crown & Bridge	160	340	370	870
Public Health Dentistry	74		200	274
Total	**1660**	**1740**	**2410**	**5840**

Note:

There should be a minimum of 240 teaching days every academic year consisting of at least 6 working hours a day excluding one hour of lunch break each day.

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2.8 Branches if any with definition: Refer Course content

2.9 Teaching learning Methods

The BDS programme offers a spiral, vertically and horizontally integrated curriculum utilising a blend of teaching and learning methods, which combine clinical skills training with the acquisition of knowledge, skills and professional attributes at all levels of the programme. All teaching and learning activities are patient and student-centered, and are specifically designed for students to experience authentic and contextual learning. Refer Section 2.5 for detailed outline.

2.10 Content of each Subjects in each year

First Year

a) General Human Anatomy including Embryology and Histology
b) General Human Physiology and Biochemistry, Nutrition and Dietetics
c) Dental Materials
d) Dental Anatomy, Embryology and Oral Histology
e) Preclinical Conservative Dentistry
f) Preclinical Prosthodontics and Crown & Bridge

Second Year

a) General Pathology and Microbiology
b) General and Dental Pharmacology and Therapeutics
c) Dental Materials
d) Pre clinical Conservative Dentistry
e) Preclinical Prosthodontics and Crown & Bridge
f) Pre clinical Orthodontics
g) Oral Pathology & Oral Microbiology

Third Year

a) General Medicine
b) General Surgery
c) Oral Pathology and Oral Microbiology
d) Conservative Dentistry and Endodontics
e) Oral & Maxillofacial Surgery
f) Oral Medicine and Radiology
g) Orthodontics & Dentofacial Orthopaedics
h) Paediatric & Preventive Dentistry
i) Prosthodontics and Crown & Bridge

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j) Periodontology

k) Public Health Dentistry

Final Year -Part I (One Year programme)

a) Orthodontics & Dentofacial Orthopaedics

b) Oral Medicine & Radiology

c) Public Health Dentistry

d) Periodontology

e) Prosthodontics & Crown and Bridge

f) Conservative Dentistry and Endodontics

g) Oral & Maxillofacial Surgery

h) Paediatric & Preventive Dentistry

Final Year- part II (Six months programme)

a) Prosthodontics and Crown & Bridge

b) Conservative Dentistry and Endodontics

c) Oral & Maxillofacial Surgery

d) Paediatric & Preventive Dentistry

Emphasis on Comprehensive Dental Care / Electives/ Research

For contents of each subject refer syllabus

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2.11 No. of hours per subject

I BDS

Sl. No.	Subjects	Lecture (hrs)	Practical (hrs)	Clinical (hrs)	Total (hrs)
1.	General Human Anatomy including Embryology and Histology	100	175	—	275
2.	General Human Physiology	120	60	—	180
3.	Biochemistry, Nutrition and Dietetics	70	60	—	130
4.	Dental Anatomy, Embryology and Oral histology	105	250	—	355
5.	Dental Materials	20	40	—	60
6.	Pre clinical Prosthodontics and Crown & Bridge	—	100	—	100
7.	Pre clinical Conservative Dentistry	—	100	—	100
	Total	**415**	**785**	**—**	**1200**

II B.D.S.

Sl. No.	Subjects	Lecture (hrs)	Practical (hrs)	Clinical (hrs)	Total (hrs)
1.	General Pathology	55	55	—	110
2.	General Microbiology	65	50	—	115
3.	General and Dental Pharmacology & Therapeutics	70	20	—	90
4.	Dental Materials	60	200	—	260
5.	Pre clinical Prosthodontics and Crown & Bridge	25	200	—	225
6.	Pre clinical Conservative Dentistry	25	100	—	125
7.	Pre clinical Orthodontics	—	160	—	160
8.	Oral Pathology &Oral Microbiology	25	50	—	75
	Total	**325**	**835**	**—**	**1160**

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III B.D.S.

Sl. No.	Subjects	Lecture (hrs)	Practical (hrs)	Clinical (hrs)	Total (hrs)
1.	General Medicine	60	—	90	150
2.	General Surgery	60	—	90	150
3.	Oral Pathology and Oral Microbiology	120	80		200
4.	Oral Medicine and Radiology	25	—	60	85
5.	Public Health Dentistry	24	—	60	84
6.	Orthodontics & Dentofacial Orthopaedics	20	—	60	80
7.	Periodontology	30		60	90
8.	Oral & Maxillofacial Surgery	26	—	110	136
9.	Paediatric and Preventive Dentistry	15	—	60	75
10.	Conservative Dentistry and Endodontics	65	—	110	175
11.	Prosthodontics and Crown & Bridge	65	40	110	215
	Total	**480**	**120**	**810**	**1440**

Final B.D.S. Part I

Sl. No.	Subjects	Lecture (hrs)	Practical (hrs)	Clinical (hrs)	Total (hrs)
1.	Oral Medicine & Radiology	50	—	140	190
2.	Public Health Dentistry	50		140	190
3.	Orthodontics & Dentofacial Orthopaedics	50	—	140	190
4.	Periodontology	50	—	140	190
5.	Oral & Maxillofacial Surgery	20	—	140	160
6	Paediatric and Preventive Dentistry	20	--	140	160
7.	Conservative Dentistry and Endodontics	40		140	180
8.	Prosthodontics and Crown & Bridge	40	—	140	180
	Total	**320**	**—**	**1120**	**1440**

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Final B.D.S. Part II

Sl. No.	Subjects	Lecture (hrs)	Practical (hrs)	Clinical (hrs)	Total (hrs)
1.	Oral & Maxillofacial Surgery	30	—	120	150
2.	Conservative Dentistry and Endodontics	30	—	120	150
3.	Prosthodontics and Crown & Bridge	30	—	120	150
4.	Paediatric and Preventive Dentistry	30	—	120	150
	Total	**120**	**—**	**480**	**600**

Note:

There should be a minimum of 240 teaching days every academic year consisting of at least 6 working hours a day excluding one hour of lunch break each day.

Each institution should prepare a master time table a format of which is given in Annexure

Teaching schedule as per the syllabus and master time table is to be prepared in all the subjects of study by the concerned HoD's in consultation with the Principal of the institution.

2.12 Practical Training: Refer Syllabus

2.13 Records: Refer Section syllabus

2.14 Dissertation: Not Applicable.

2.15 Specialty training if any: Refer Syllabus

2.16 Project work to be done if any: Refer Syllabus

2.17 Any other requirements: Refer syllabus

2.18 Prescribed/Recommended textbooks for each subject

Subject: **General Human Anatomy including Embryology and Histology**

1) Clinical Anatomy for Medical Students, Snell (Richard S.), Little Brown & company, Boston.
2) Anatomy, R J Last's - McMinn,
3) Cunningham Manual of Practical Anatomy: Head & Neck & Brain.Vol.III, Romanes (G.J) Oxford Medical publication.
4) Functional Histology, Wheater, Burkitt & Daniels, Churchill Livingstone.
5) Medical Embryology, Sadler, Langman's,
6) Grant's Atlas of Anatomy, James E Anderson, Williams& Wilkins.
7) Gray's Anatomy, Williams, Churchill Livingstone.
8) Medical Genetics, Emery.
9) Essentials of Anatomy for Dentistry Students, D R Singh, Wolters Kluwer.

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Subject: **Physiology**

1) Text book of Physiology, Guyton
2) Review of Medical Physiology, Ganong
3) Human physiology, Vander
4) Concise Medical Physiology, Choudhari
5) Human Physiology, Chaterjee
6) Human Physiology for BDS students, A.K. Jain

Reference books;

1) Physiology, Berne & Levey
2) Physiological basis of Medical Practice,West-Best & Taylor's

Experimental Physiology:

1) Practical Physiology, Rannade
2) A text book of practical physiology, Ghai
3) Clinical Methods, Hutchison's

Subject: **Biochemistry**

1) Textbook of Biochemistry for Dental Students, DM Vasudevan, Sreekumari S
2) Text book of Biochemistry-U Satyanarayana

Reference books;

1) Harper's Biochemistry, R.K.Murray et.al.
2) Text book of Biochemistry with clinical correlations T.N. Devlin
3) Basic and applied Dental Biochemistry, R.A.D. Williams & J.C.Elliot
4) Nutritional Biochemistry S. Ramakrishnan and S.V. Rao

Subject: **Dental Anatomy, Embryology and Oral Histology**

1) Orban's Oral Histology & Embryology - S.N.Bhaskar
2) Oral Development & Histology - James & Avery
3) Wheeler's Dental Anatomy, Physiology & Occlusion – Major M.Ash
4) Dental Anatomy - its relevance to dentistry - Woelfel & Scheid
5) Applied Physiology of the mouth – Lavelle
6) Physiology & Biochemistry of the mouth – Jenkins
7) Oral Histology- 'Development, Structure and Function- A. R. Tencate

Subject: **General Pathology**

1) Robbins - Pathologic Basis of Disease Cotran, Kumar, Robbins

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2) Anderson's Pathology Vol 1 & 2 Editors - Ivan Damjanov & James Linder
3) Wintrobe's clinical Haematology Lee, Bithell, Foerster, Athens, Lukens

Subject: **Microbiology**

1) Text book of Microbiology - R.Ananthanarayan & C.K.Jayaram Paniker.
2) Medical Microbiology - David Greenwood et al.
3) Textbook of Microbiology for Dental students- surinder Kumar

Reference books;

1) Microbiology - Prescott, et al.
2) Microbiology - Bernard D. Davis, et al.
3) Clinical & Pathogenic Microbiology - Barbara J Howard, et al.
4) Mechanisms of Microbial diseases - Moselio Schaechter, et al.
5) Immunology an Introduction – Tizard
6) Immunology - Evan Roitt, et al.

Subject: **Dental Materials**

1) Phillips Science of Dental Materials - Kenneth J. Anusavice
2) Restorative Dental Materials -Robert G.Craig
3) Notes on Dental Materials - E.C. Combe

Reference books:-

1) Introduction to Dental Materials, Van Noort,
2) Applied Dental Materials, McCabe,
3) Materials used in Dentistry- Mahalaxmi.S

Subject: **General and Dental Pharmacology and Therapeutics**

1) Basic and Clinical pharmacology,Bertam G. Katzung, Appleton & Lange
2) Clinical Pharmacology, Lauerence DR, Churchill Livingstone
3) Pharmacology and Pharmacotherapeutics Part I & Part II, Satoskar R.S. & Bhandarkar S.D, Popular Prakashan Mumbai.
4) Essentials of Medical Pharmacology, Tripathi K.D, Jaypee Brothers
5) Medical Pharmacology, Udaykumar, CBS publishing

Subject: **General Medicine**

1) Textbook of Medicine Davidson
2) Textbook of Medicine Hutchinson

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Subject: **General Surgery**

1) Short practice of Surgery, Baily & Love
2) A Consice Text Book of Surgery, S.Das

Subject: **Oral Pathology & Oral Microbiology**

1) A Text Book of Oral Pathology Shafer, Hine & Levy
2) Oral Pathology - Clinical Pathologic correlations Regezi & Sciubba.
3) Oral Pathology Soames & Southam.
4) Oral Pathology in the Tropics Prabhu, Wilson, Johnson & Daftary
5) Synopsis of Oral Pathology, Bhaskar, CBS publishing
6) Textbook of Oral Pathology-Ghom,Mhaske

Subject: **Public Health Dentistry**

1) Dentistry Dental Practice and Community by David F. Striffler and Brain A. Burt, W. B. Saunders Company
2) Principles of Dental Public Health by James Morse Dunning, Harward University Press.
3) Dental Public Health and Community Dentistry Ed by Anthony Jong Publication by The C. V. Mosby Company
4) Community Oral Health-A system approach by Patricia P. Cormier and Joyce I. Levy published by Apple ton-Century-Crofts/ New York,
5) Community Dentistry-A problem oriented approach by P. C.
6) Dental Hand book series Vol.8 by Stephen L. Silverman and Ames F. Tryon, Series editor-Alvin F. Gardner, PSG Publishing company Inc. Littleton Massachusetts,
7) Dental Public Health- An Introduction to Community Dentistry. Edition by Geoffrey L. Slack and Brain Burt, Published by John Wright and sons Bristol.
8) Oral Health Surveys- Basic Methods, 1997, published by W. H. O Geneva available at the regional office New Delhi.
9) Preventive Medicine and Hygiene-By Maxcy and Rosenau, published by Appleton Century Crofts,
10) Preventive Dentistry-by J. O. Forrest published by John Wright and sons Bristoli,
11) Preventive Dentistry by Murray,.
12) Text Book of Preventive and Social Medicine by Park and park,
13) Community Dentistry by Dr. Soben Peter.

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Public Health dentistry, Sikri. CBS Publishing

Subject: **Research methodology and Bio-statistics**

1) Introduction to Bio-statistics by B. K. Mahajan
2) Introduction to Statistical Methods by Grewal

Subject: **Paediatric and Preventive Dentistry**

1) Dentistry for the Child and Adolescence - Mc. Donald.
2) Pediatric Dentistry (Infancy through Adolescence) - Pinkham.
3) Pediatric Dentistry : Total Patient Care – Stephen H.Y. Wei
4) Clinical Pedodontics – Sidney B. Finn
5) Fundamentals of Pediatric Dentistry – R.J. Mathewson
6) Handbook of Clinical Pedodontics - Kenneth. D.
7) Text Book of Pedodontics- Shobha Tandon
8) Pediatric Dentistry - Damle S. G.
9) Kennedy's Pediatric Operative Dentistry - Kennedy & Curzon.
10) Handbook of Pediatric Dentistry – Cameron and Widmer
11) Pediatric Dentistry - Richard R. Welbury
12) Pedodontics: A Clinical Approach - Goran Koch
13) Orthodontics and Pediatric Dentistry (Colour Guide) - D Millet & R Welbury
14) Color Atlas of Oral Diseases in Children and Adolescents - George Laskaris
15) Dental Management of the Medically Compromised Patient –J.W. Little
16) Pediatric Dentistry – Scientific Foundations and Clinical Practice – Stewart and Barber.
17) Clinical Use of Fluorides - Stephen H. Wei.
18) Understanding of Dental Caries - Niki Foruk.
19) Essentials of Community & Preventive Dentistry - Soben Peters.
20) Behaviour Management – Wright
21) Traumatic Injuries - Andreason.
22) Occlusal Guidance in Pediatric Dentistry - Stephen H. Wei / Nakata
23) Pediatric Oral & Maxillofacial Surgery - Kaban.
24) Pediatric Medical Emergencies - P. S. Whatt.
25) An Atlas of Glass Ionomer Cements - G. J. Mount..
26) Textbook of Pediatric Dentistry - Braham Morris.
27) Primary Preventive Dentistry - Norman O. Harris.

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28) Preventive Dentistry - Forrester.
29) Contemporary Orthodontics - Profitt..
30) Preventive Dentistry - Depaola.
31) Endodontics - Ingle.
32) Pathways of Pulp - Cohen.
33) Management of Traumatized anterior Teeth - Hargreaves.

Subject: **Oral Medicine and Radiology**

Oral Diagnosis, Oral Medicine & Oral Pathology

1) Oral Medicine, Burkit, J.B. Lippincott Company
2) Principles of Oral Diagnosis, Coleman, Mosby Year Book
3) Oral Manifestations of Systemic Diseases, Jones, W.B. Saunders company
4) Oral Diagnosis & Oral Medicine, Mitchell
5) Oral Diagnosis, Kerr
6) Oral Diagnosis & Treatment ,Miller
7) Clinical Methods, Hutchinson
8) Shafers, Oral Pathology
9) Principles and practice of Oral Medicine, Sonis.S.T., Fazio.R.C. and Fang.L

Oral Radiology

1) Oral Radiology White & Goaz, Mosby year Book
2) Dental Radiology, Weahrman,C.V. Mosby Company
3) Oral Roentgenographs Diagnosis,Stafne,W.B.Saunders Co
4) Fundamentals of Dental radiology, Sikri, CBS Publishing.

Subject: **Orthodontics and Dentofacial Orthopaedics**

1) Contemporary Orthodontics- William R. Proffit
2) Orthodontics For Dental Students- White And Gardiner
3) Handbook Of Orthodontics- Moyers
4) Orthodontics - Principles And Practice- Graber
5) Design, Construction And Use Of Removable Orthodontic Appliances- C. Philip Adams
6) Clinical Orthodontics: Vol 1 & 2- Salzmann

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Subject: **Oral and Maxillofacial Surgery**

(1) Impacted teeth, Alling John et al

(2) Principles of Oral&maxillofacial Surgery vol1,2&3 Peterson LJ et al

(3) Text book of Oral&maxillofacial Surgery, Srinivasan B

(4) Hand book of Medical emergencies in the dental office, Melamed SF

(5) Killey's Fracture of the Mandible, Banks

(6) Killey's Fractures of the Middle 3 of the Facial Skeleton; Banks P

(7) The Maxillary Sinus and its Dental Implications; Mc Govanda

(8) Killey and Kays Outline of Oral Surgery - Fart l& 2; Seward GR & et al

(9) Essentials of Safe Dentistry for the Medically Compromised Patients; Mc Carthy FM

(10) Oral & Maxillofacial Surgery, Vol l& 2; Laskin DM

(11) Extraction of Teeth; Howe GL

(12) Minor Oral Surgery; Howe GL

(13) Contemporary Oral & Maxillofacial Surgeiy; Peterson LJ

(14) Text book of Oral &Maxillofacial Surgery , Neelima Anil Malik

(15) Text book of Oral &Maxillofacial Surgery, SM Balaji

(16) Principles of Oral Surgery; Moore J'R

(17) Handbook of Local Anaesthesia, Malamed

(18) Sedation; Malamed

(19) Text book of Oral & Maxillofacial Surgery; Gustav O Kruger

(20) A Practical guide to Hospital Dentistry, Dr. George Varghese, Jaypee brothers publishing, New Delhi.

(21) A Practical guide to the Management of Impacted Tooth, Dr. George Varghese, Jaypee brothers publishing, New Delhi.

(22) Textbook of Local Anaesthesia; Monheim

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Subject: **Prosthodontics, and Crown & Bridge**

1) Syllabus of Complete denture -Charles M.Heartwell Jr. and Arthur O. Rahn
2) Prosthodontic treatment for edentulous patients- Carl O.Boucher
3) Essentials of complete denture prosthodontics by - Sheldon Winkler.
4) Maxillofacial prosthetics by - Willam R.Laney.
5) McCraken's Removable partial Prosthodontics
6) Removable partial Prosthodontics by - Ernest L. Miller and Joseph E.Grasso.
7) Stewart's Clinical Removable Partial Prosthodontics, Quintessence Publishing Co.
8) Fundementals of Fixed Prosthodontics, Shillingburg, Quintessence Publishing Co.
9) Management of Temporomandibular Disorders and Occlusion, Jeffery P.Okeson, Mosby Year book,Inc.
10) A Primer on Complete Denture Prosthodontics, K Chandrasekharan Nair, Ahuja Publishing house.
11) Textbook of Prosthodontics,V Rangarajan & TV Padmanabhan,Elsevier.

Subject: **Periodontology**

1) Glickman's Clinical Periodontology-Carranza

Reference books

1) Essentials of Periodontology and periodontics- Torquil MacPhee
2) Contemporary periodontics- Cohen
3) Periodontal therapy- Goldman
4) Orbans' periodontics- Orban
5) Oral Health Survey- W.H.O.
6) Preventive Periodontics- Young and Stiffler
7) Advanced Periodontal Disease- John Prichard
8) Clinical Periodontology- Jan Lindhe
9) Periodontics- Baer & Morris.

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Subject: **Conservative Dentistry and Endodontics**

1) The Art & Science of Operative Dentistry,Sturdevant,MosbyU.S.A
2) Principle & Practice of Operative Dentistry, Charbeneu,Varghese Publishing, Mumbai.
3) Sturdevant's Art & Science of Operative Dentistry, Heymann, Swift, Ritter & Gopikrishna- South Asia Edition.
4) Fundementals of Operative Dentistry- Summit, Robbins, Hilton, Schwartz.
5) Grossman's Endodontic Practice, B.Suresh Chandra & V.GopiKrishna,Wolters Kluwer
6) Endodontics in Clinical Practice- Harty

Subject: **Esthetic Dentistry**

1) Esthetic guidelines for restorative dentistry; Scharer & others
2) Esthetics of anterior fixed prosthodontics; Chiche (GJ) & Pinault (Alain)
3) Esthetic & the treatment of facial form, Vol 28; Mc Namara (JA)
4) Contemporary Esthetic Dentistry – George. A. Freedman.

Subject: **Forensic Odontology**

1) Practical Forensic Odontology- Derek.H.Clark,Butterworth-Heinemann
2) Manual of Forensic Odontology, C Michael Bowers, Gary Bell

Subject: **Behaviourial Science**

1) General Psychology- Hans Raj, Bhatia
2) Behavioural Sciences in Medical Practice- Manju Mehta
3) General psychology — Hans Raj, Bhatia
4) General psychology —Munn
5) Sciences basic to psychiatry -- Basanth Puri & Peter J Tyrer

Subject: **Ethics**

1) Medical Ethics, Francis C M, Jaypee Brothers, New Delhi

Subject: **Implantology**

1) Contemporary Implant Dentistry, Carl. E.Misch,Mosby
2) Osseointegration and Occlusal Rehabilitation, Hobo S., Ichida. E. andGarcia L.T. Quintessence Publishing Company,

Note:

1. *Book titles will keep on adding in view of the latest advances in the Dental Sciences.*
2. *Standard books from Indian authors are also recommended*

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2.19 Reference books: *Included along with recommended books*

2.20 Journals

List of Journals

1) Journal of Dentistry
2) British Dental Journal
3) International Dental Journal
4) Dental Abstracts
5) Journal of American Dental Association
6) British Journal of Oral and Maxillofacial Surgery
7) Oral Surgery, Oral Pathology and Oral Medicine
8) Journal of Periodontology
9) Journal of Endodontics
10) American journal of Orthodontics and Dentofacial Orthopaedics
11) Journal of Prosthetic Dentistry
12) International Journal of Prosthodontics
13) Journal of Public Health Dentistry
14) Endodontics and Dental Traumatology
15) Journal of Dental Education
16) Dental Update
17) Journal of Dental Material
18) International Journal of Pediatric Dentistry
19) International Journal of Clinical Pediatric dentistry

Note: This is the minimum requirement. More journals both Indian and Foreign are recommended for imparting research oriented education.

2.21 Logbook: *Refer syllabus*

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3. EXAMINATIONS

3.1 Eligibility to appear for University examinations

a) Preface:

i. Evaluation is a continuous process, which is based upon criteria developed by with certain objectives to assess the performance of the learner. This also indirectly helps in the measurement of effectiveness and quality of the concerned B.D.S. programme.

ii. Evaluation is achieved by two processes

1) Formative or internal assessment
2) Summative or university examinations.

Formative evaluation is done through a series of tests and examinations conducted periodically by the institution.

Summative evaluation is done by the university through examination conducted at the end of the specified course.

b) Methods of evaluation:

Evaluation may be achieved by the following tested methods:

i. Written test
ii. Practical examination
iii. Clinical examination
iv. Viva voce

c) Eligibility criteria:

For a candidate to be eligible to write the university examination of an year of study **for the first time** he/she should have minimum 80% attendance in **all the subjects** in which examination is being held for the year of study and a minimum of 70% in Lectures and Practical/ Clinical separately in all the non-exam subjects for the year (Refer Section 1.8). However candidates with such 80% attendance in all the subjects of study for which university examination is held for a particular year will be eligible to attempt the university examination **only in those subjects** in which he/she has secured the minimum requirement of 40% of internal assessment marks. A candidate can reappear for university examination in the failed subjects provided he/she has secured minimum 70% attendance (theory & practical

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separately) and have scored minimum 40% marks in internal assessment conducted for the subject during the supplementary period.

3.2 Schedule of regular/Supplementary examinations

The University examination for a subject shall be conducted twice in a year as per the schedule approved by the Board of Examinations at an interval of not less than four to six months as notified by the university from time to time.

3.3 Scheme of examination Showing Maximum and Minimum Marks

The scheme of examination for B.D.S. Course shall be divided into 1st B.D.S. examination at the end of the first, 2nd B.D.S. examination at the end of second, 3rd B.D.S. examination at the end of third and Final BDS Part I examination at the end of fourth academic year. The Final B.D.S part II examination will be held on completing six months of the fifth academic year. The examination shall be open to a candidate who satisfies the requirements of attendance, progress and other rules governing the institution and The University.

1. Distribution of Marks

i. **For each paper in which written examination is held:**

Theory	
University written examination	*70*
University Viva Voce	*20*
Internal assessment	*10*
Total	***100***
Practical/ clinical	
University Practical/ Clinical examination	*80*
Internal assessment	*20*
Total	***100***
Aggregate marks for each paper	***200***

ii. **For Preclinical Examination in Prosthodontics/Conservative Dentistry & Orthodontics**

University Practical examination	*60*
Viva voce	*20*
Internal assessment Practical	*20*
Total	***100***

preclinical examination in each subject is to be conducted separately.

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Detailed mark distribution of each paper for each subject is given in Table below

Distribution of marks in University examination and internal assessment for various subjects from first year to fifth year.

Year of Study	Subjects		Theory Marks				Practical/ Clinical Marks			Grand Total Marks
			University written	Viva Voce	Internal Assessment	**Total**	University examination	Internal Assessment	**Total**	
I BDS	General Anatomy including Embryology and Histology		70	20	10	**100**	80	20	**100**	**200**
	General Human Physiology and Biochemistry	Section A Physiology	35	10	5	**50**	40	10	**50**	**200**
		Section B Biochemistry	35	10	5	**50**	40	10	**50**	
	Dental Anatomy, Embryology and Oral Histology		70	20	10	**100**	80	20	**100**	**200**
II BDS	General Pathology and Microbiology	Section A Pathology	35	10	5	**50**	40	10	**50**	**200**
		Section B Microbiology	35	10	5	**50**	40	10	**50**	
	General and Dental Pharmacology and Therapeutics		70	20	10	**100**	80	20	**100**	**200**
	Dental Materials	Section A Prosthodontics	35	10	5	**50**	40	10	**50**	**200**
		Section B Conservative dentistry	35	10	5	**50**	40	10	**50**	
	Pre Clinical Conservative Dentistry		-	20	-	**20**	60	20	**80**	**100**
	Pre Clinical Prosthodontics		-	20	-	**20**	60	20	**80**	**100**
	Pre Clinical Orthodontics		-	20	-	**20**	60	20	**80**	**100**
III BDS	General Medicine		70	20	10	**100**	80	20	**100**	**200**
	General Surgery		70	20	10	**100**	80	20	**100**	**200**
	Oral Pathology & Oral Microbiology		70	20	10	**100**	80	20	**100**	**200**
Final BDS part I	Oral Medicine and Radiology		70	20	10	**100**	80	20	**100**	**200**
	Periodontology		70	20	10	**100**	80	20	**100**	**200**
	Orthodontics & Dentofacial Orthopaedics		70	20	10	**100**	80	20	**100**	**200**
	Public Health Dentistry		70	20	10	**100**	80	20	**100**	**200**
Final BDS part II	Prosthodontics & Crown and Bridge		70	20	10	**100**	80	20	**100**	**200**
	Conservative Dentistry and Endodontics		70	20	10	**100**	80	20	**100**	**200**
	Paediatric & Preventive Dentistry		70	20	10	**100**	80	20	**100**	**200**
	Oral & Maxillofacial Surgery		70	20	10	**100**	80	20	**100**	**200**

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3.4 Papers in each year

I B.D.S. Examination:

i. General Anatomy including Embryology and Histology
ii. General Human Physiology and Biochemistry
iii. Dental Anatomy, Embryology and Oral Histology

II B.D.S. Examination:

Only a candidate who has successfully completed and passed all the 1st B.D.S. subjects can appear.

i. General Pathology and Microbiology
ii. General and Dental Pharmacology and Therapeutics
iii. Dental Materials
iv. Pre Clinical Conservative Dentistry(Only Practical and Viva)
v. Pre Clinical Prosthodontics and Crown & Bridge (Only Practical and Viva)
vi. Pre Clinical Orthodontics (Only Practical and Viva)

III B.D.S. Examination:

Only a candidate who has successfully completed and passed all the 2nd B.D.S. subjects can appear.

i. General Medicine
ii. General Surgery
iii. Oral Pathology & Oral Microbiology

Final BDS - Part I Examination:

Only a candidate who has successfully completed and passed all the 3rd BDS subjects can appear.

i. Oral Medicine and Radiology
ii. Periodontology
iii. Orthodontics & Dentofacial Orthopaedics
iv. Public Health Dentistry

Final BDS - Part II Examination:

Only a candidate who has appeared for the Final BDS Part I examination can appear.

i. Prosthodontics & Crown and Bridge
ii. Conservative Dentistry and Endodontics
iii. Oral & Maxillofacial Surgery
iv. Paediatric & Preventive Dentistry

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3.5 Details of theory examination (written)

1. The written examination in each paper will be of three hours duration and shall have maximum marks of 70. Type of Questions and Distribution of marks for written examination should be as given in **table I** given below.
2. The paper of Physiology & Biochemistry will be divided into two Sections, Section A (Gen. Physiology) and Section B (Biochemistry) of equal marks. Type of Questions and Distribution of marks for written examination should be as given in **table II** below.
3. The paper of Pathology & Microbiology will be divided into two Sections, Section A (Gen. Pathology) and Section B (Microbiology) of equal marks. Type of Questions and Distribution of marks for written examination should be as given in **table III** below.
4. The paper of Dental Materials will be divided into two Sections, Section A (Prosthodontics) and Section B (Conservative Dentistry) of equal marks. Type of Questions and Distribution of marks for written examination should be as given in **table IV** below.
5. The question paper should contain different types of questions like essay, short note and brief note.
6. The nature of questions should be aimed to evaluate students of different standards ranging from average to excellent.
7. The questions should cover as broad an area of content of the course as possible. The essay questions should be properly structured and the marks specifically allotted.

Table I.

Type of Questions	No. of Questions	Marks / Question	Total Marks
Structured Essay	2	10	20
Short note	4	5	20
Brief note	10	3	30
Grand Total			**70**

Table II.

Physiology and Biochemistry

Subject	Type of Questions	No. of Questions	Marks of Questions	Total Marks
Section A Physiology	Structured Essay	1	10	10
	Short note	2	5	10
	Brief note	5	3	15
	Grand Total			**35**

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Subject	Type of Questions	No. of Questions	Marks of Questions	Total Marks
Section B Biochemistry	Structured Essay	1	10	10
	Short note	2	5	10
	Brief note	5	3	15
	Grand Total			**35**

Table III.
Pathology and Microbiology

Subject	Type of Questions	No. of Questions	Marks of Questions	Total Marks
Section A Pathology	Structured Essay	1	10	10
	Short note	2	5	10
	Brief note	5	3	15
	Grand Total			**35**

Subject	Type of Questions	No. of Questions	Marks of Questions	Total Marks
Section B Microbiology	Structured Essay	1	10	10
	Short note	2	5	10
	Brief note	5	3	15
	Grand Total			**35**

Table IV.
Dental Materials

Subject	Type of Questions	No. of Questions	Marks of Questions	Total Marks
Section A Prosthodontics	Structured Essay	1	10	10
	Short note	2	5	10
	Brief note	5	3	15
	Grand Total			**35**

Subject	Type of Questions	No. of Questions	Marks of Questions	Total Marks
Section B Conservative Dentistry	Structured Essay	1	10	10
	Short note	2	5	10
	Brief note	5	3	15
	Grand Total			**35**

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3.6 Model question paper for each subject

Given as Annexure

3.7 Internal assessment

The internal assessment examinations in theory and practical/ clinical may be held at least twice in a particular year followed by a model examination in the pattern of university examination to be held at the end of the year of study. Internal assessment marks for a candidate in a subject will be calculated as the average of, marks obtained in the model examination and the highest among all other internal examinations, in the subject. This average mark will be reported to the University. The Heads of the Department and College Principal should ensure that the class average of internal assessment marks reported to the University in each subject/paper is not more than 75% in both theory and practical/clinical separately. For a student to be eligible to appear for the University examination he/she should have secured at least 40% of maximum marks in internal assessment for both theory and practical/clinical in all subjects/papers, separately (i.e. minimum 4/10 in theory and 8/20 in practical/clinical). (*For calculating internal assessment mark in papers where subjects are combined viz. General Human Physiology & Biochemistry, General Pathology & Microbiology and Dental Materials, marks obtained in the two subjects will be counted together for reporting to University and for applying all other stipulations mentioned above*)

3.8 Details of Practical/Clinical examinations

1. Objective Structured Clinical Evaluation:

   The clinical /practical examination should include different procedures for the candidate to express one's skills. A number of examination stations with specific instructions to be carried out may be provided. This can include clinical procedures, laboratory experiments, spotters etc. Evaluation must be made objective and structured. The method of objective structured clinical examinations should be followed. This will avoid examiner bias because both the examiner and the examinee are given specific instructions on what is to be observed at each station.

2. Records/Log Books:

   The candidate should be given credit for his records based on the scores obtained in the record. The marks obtained for the record in the first appearance can be carried over to the subsequent appearances if necessary.

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3. Scheme of clinical and practical examinations:

The specific scheme of clinical/practical examinations, the type of clinical procedures/experiments to be performed and marks allotted for each are given in Scheme of examination for each subject (Section 2.6). Changes if any should be discussed and finalized by the Chairman and members of the board of examiners and to be published prior to the conduct of the examinations along with the publication of time table for practical examination. This scheme should be brought to notice of the external examiner as and when the examiner reports. The practical/clinical examinations should be evaluated by two examiners of which one shall be an external examiner appointed from other zones of the university or outside University. Each candidate should be evaluated by each examiner independently and marks computed at the end of the examination.

3.9 Number of Examiners (internal & external)and their qualifications

For practical/Clinical and Viva voce examination there shall be two examiners for each paper, one internal and one external, from Medical/ Dental Institutions approved/recognized by the Dental Council of India for B.D.S. Course. The internal examiner will be from within the institution. The external examiner can be from a different zone of the University or from outside University. When the number of candidates registered for a subject/s in a particular examination exceeds 75, two sets of examiners (one external & one internal each) may be appointed for the subject/s, such that the practical and viva examination for the first half of candidates may be conducted by one set of examiners and that of the remaining candidates may be done be the other set of examiners. No person shall be an External Examiner to the same college for more than 3 consecutive years. However, if there is a break of one year the person can be reappointed.

Note:

1) *In case of Physiology and Biochemistry if Internal examiner is from Physiology, External examiner should be from Biochemistry and vice versa*
2) *In case of Pathology and Microbiology if Internal examiner is from Pathology, External examiner should be from Microbiology and vice versa*

   In case of Dental Materials, if Internal examiner is from Prosthodontics, External examiner should be from Conservative Dentistry and vice versa

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Qualification and experience to be eligible for examinership for BDS examination:

1) M.D.S. Degree in the concerned subject from a DCI recognized Institution.
2) Four years teaching experience in the subject after MDS in the concerned subject in a Dental College approved/recognized by the Dental Council of India for BDS.
3) Should be qualified as per DCI to hold the post of Reader or above in a Dental Institution approved/recognised by the Dental Council of India for B.D.S.
4) In case of medical subjects the qualification of examiners shall be the same as that prescribed by the Dental Council of India for the concerned subject.
5) Age not more than 65 years or as prescribed by DCI from time to time.

3.10 Details of Viva.

Viva voce is an excellent mode of assessment because it permits a fair broad coverage and it can assess the problem solving capacity of the student. An assessment related to the affective domain is also possible through viva voce. It is desirable to conduct the viva voce independently by each examiner. In order to avoid vagueness and to maintain uniformity of standard and coverage, questions can be pre-formulated before administering them to each student. Twenty marks are exclusively allotted for viva voce and that can be divided amongst the two examiners.

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4. INTERNSHIP

COMPULSORY PAID ROTATING INTERNSHIP PROGRAMME (CRRI)

4.1 Eligibility for Internship:

Candidates who fulfill the following criteria are eligible to start Internship (CRRI):

1. Must have successfully completed all the Final BDS Part I and Part II examinations within the stipulated time frame, if any.
2. Must have obtained temporary registration from Kerala Dental Council.
3. Must have satisfied all other criteria, if any, for starting internship put forth by the Institution, University and DCI from time to time.

4.2 Details of Internship Training Programme:

1. <u>Start of Internship programme</u>

As far as possible the internship programme will commence within 10 days after the declaration of Final BDS part II result by the University. Before commencement of the Internship training Programme the Dean/ Principal shall conduct Orientation Workshop for the interns to get acquainted with the details of Internship training Programme. The Orientation Workshop shall cover Ethical issues, Patient Management, Public Relation issues, Emergency Care of the patients (including CPR), Medico-legal issues, Public Health and National Oral Health Policy. It shall be mandatory for the all the interns to attend the Orientation Workshop. The period of the workshop shall be included in the period of one year Internship.

2. <u>Curriculum of Dental internship programme</u>

1. The duration of Internship shall be one year (365 days), not relaxable under any pretext.
2. All parts of internship shall be done in a Dental College duly recognized/ approved by the Dental Council of India for the purpose of imparting education and training to Dental graduates in the country.
3. During the internship period the candidates will be posted in all the clinical departments of the institution.
4. Each Intern shall be paid stipendiary allowance during the period of internship not extending beyond a period of one year.

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5. The internship shall be compulsory and rotating as per the regulations prescribed for the purpose.
6. During the internship period they will have to attend to the routine clinical activities of the department under the supervision of faculty members.
7. The interns will also be posted in the Dental Casualty for attending to the emergency services of the institution and may also include rural postings at satellite dental clinics of the institution.
8. Internship is considered as an integral part of BDS course and hence the B.D.S. degree shall be conferred only on satisfactory completion of internship.
9. As far as possible the Internship training Programme shall be commenced by the concerned Dean/ Principal not later than 10 days from the date of declaration of Final B.D.S. Part II result by KUHS.

3. <u>Determinants of Curriculum for internship:</u>

1. The curricular contents of internship training shall be based on:
2. Dental health needs of the society.
3. Financial, material and manpower resources available for the purpose.
4. National Dental Health Policy.
5. Socio-economic conditions of the people in general.
6. Existing Dental facilities at par with the primary health care concept for the delivery of health services.
7. Task analysis of what dental graduates are expected to do in Dentistry in various practice settings. (Private and Government service.)
8. Epidemiological studies conducted to find out prevalence of different dental health problems, taking into consideration the magnitude of dental problems, severity of dental problems and social disruption caused by these problems.

4. <u>Objectives –</u>

A. *To facilitate reinforcement of learning and acquisition of additional knowledge:-*

a. Reinforcement of knowledge.
b. Techniques & resources available to the individual and the community: Social and cultural setting.
c. Training in a phased manner, from a shared to a full responsibility.

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B. *To facilitate the achievement of basic skills: attaining competence vs. maintaining competence in:-*

a. History taking.
b. Clinical Examination.
c. Performance and interpretation of essential laboratory data.
d. Data analysis and inference.
e. Communication skills aimed at imparting hope and optimism in the patient.
f. Attributes for developing working relationship in the Clinical setting and Community team work.

C. *To facilitate development of sound attitudes and habits:-*

a. Emphasis on individual and human beings, and not on disease/symptoms.
b. Provision of comprehensive care, rather than fragmentary treatment
c. Continuing Dental Education and Learning of accepting the responsibility,

D. *To facilitate understanding of professional and ethical principles including: -*

a. Rights and dignity of patients
b. Consultation with other professionals and referral to seniors/institutions.
c. Obligations to peers, colleagues, patients, families and Community.
d. Provision of free professional services in an emergent situation.

E. *To initiate individual and group action, leading to disease prevention and oral and dental health promotion, at the level of individuals, families and the Community.*

F. *To maintain day to day record, in the form of a performance log book,the quantum of work done and any other assignment allotted to each intern by the department. HOD/Teaching staff supervising the intern shall duly certify the work done by awarding grades.*

(Complete record of all cases treated department wise to be prepared and presented in the form of performance Log book and case files at the time of completion of internship programme.)

5. <u>Content (subject matter) –</u>

The compulsory rotating paid Dental Internship shall include training in Oral Medicine & Radiology; Oral & Maxillofacial Surgery; Prosthodontics; Periodontics; Conservative

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Dentistry; Paediatric Dentistry; Oral Pathology & Microbiology; Orthodontics and Community Dentistry .

6. <u>Duties & responsibilities of Intern posted in various departments:-</u>

i. Attending to the routine O.P in the Department
ii. Carrying out the routine clinical procedures in the department
iii. Carrying out Patient and instrument Preparation for clinical procedures.
iv. Carrying out all Clinical procedures including impression making, and pouring casts (i.e. steps including mixing of impression materials & gypsum products, mixing of restorative materials and removal of casts from impressions to be done by the intern without seeking assistance)
v. Fabrication insertion and follow up of removable orthodontic appliances.
vi. Attending to the casualty duties of the institution
vii. Maintenance of log book and records
viii. Carrying out any other duty as instructed by the Head of the Department.
ix. Maintenance of proper dress code and attire.

Note: The entire clinical work done by intern will be under the supervision of faculty members. In the absence of faculty the intern will be under the supervision of Senior/Junior Resident.

7. <u>General Guidelines: -</u>

It shall be task-oriented training. The interns should participate in various institutional and field programmes and be given due responsibility to perform the activities in all departments of the Dental College and associated Institutions.

In order to facilitate achievement of basic skills and attitudes, following facilities should be provided to all dental graduates:

I. History taking, examination, diagnosis, charting and recording treatment plan of cases.
II. Presentation of cases in a group or Seminar.
III. Care and sterilization of instruments used in dental practice.
IV. Performance and interpretation of essential laboratory tests and other relevant investigations.
V. Data analysis and inference.

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VI. Proper use of antibiotics, anti-inflammatory and other drugs, as well as other therapeutic modalities.

VII. Education of patients, their relatives and community on all aspects of dental health care while working in the institution as also in the field.

VIII. Communication aimed at inspiring hope, confidence and optimism.

IX. Legal rights of patients and obligations of dental graduate under forensic jurisprudence.

X. It shall be binding on the interns to follow strictly the 'Code of Conduct' prescribed by the institution/ University/ Govt. for the regulation of the conduct of a Dental student in the State of Kerala.

Breach of Code of Conduct / discipline by the intern shall disqualify him/her from pursuing Internship Training Programme for a period as may be specified by the institutions/ University in such cases.

XI. The University has laid down the minimum quantum of work to be done by each intern department wise; however the clinical work allotted by the department has to be necessarily carried out by the intern.

XII. Workshops to be arranged by the colleges immediately after publication of final BDS part II result to orient the interns about ethical issues, patient management issues, public relation issues, emergency care of the patients, medico-legal issues, record keeping, public health & national oral health policy etc.

8. <u>Duration of internship in each department.</u>

Sl.No.	Department	No. of Days
1.	Prosthodontics and Crown & Bridge	60
2.	Oral & Maxillofacial Surgery	60
3.	Conservative dentistry& Endodontics	45
4.	Periodontics	45
5.	Paediatric and Preventive Dentistry	30
6.	Oral Medicine & Radiology	30
7.	Orthodontics and Dentofacial Orthopaedics	30
8.	Public Health Dentistry/ Rural services/Palliative care	30
9.	Oral Pathology & Oral Microbiology including Forensic Odontology	15
10.	Elective (any of the subjects listed from 1 to 7)	20

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9. Leave

Leave is not the right of an intern. For any kind of leave prior permission from the head of the department where the intern is posted is mandatory. An intern shall be entitled for a maximum of 15 days leave during one year period of internship posting. An intern will not be permitted to avail more than 3 days leave in any department. Period of leave in excess of 3 days in a department will have to be repeated in the same department as extension posting. Under any circumstances including maternity leave this period will not be condoned by any authority.

10. Internship completion certificate

An intern will be issued internship completion certificate (Refer Annexure III) by the office of the Dean / Principal only on completion of internship training programme satisfactorily. It is mandatory for the intern to attend at least one workshop on Basic Life Support and emergency management for issue of the internship certificate.

11. Registration with council

On Successful completion of both Final BDs Part I & II examinations the candidates can apply for issue of provisional degree certificate from the University. Before starting internship a temporary registration from the Kerala Dental council is mandatory. On successful completion of One year internship programme the candidate can apply for permanent degree certificate.

12. Stipend

As per the norms of the government/ KUHS framed from time to time.

13. Eligibility for award of degree

A candidate, who has successfully completed all the subjects of the course and one year internship with in the specified period, if any, will be eligible for the award of degree.

14. Transcript

To be issued by the institution where the candidate underwent training.

4.3 Model of Internship mark list

Not Applicable

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4.4 Extension rules

The duration of Internship shall be one year (365 days), not relax able under any pretext. An intern shall be entitled for a maximum of 15 days leave during one year period of internship posting. Period of leave in excess of 3 days in a department will be considered as absence and the candidate will have to do extension posting in the same department for the number of days he was absent in the department.

4.5 Details of training given:

1. Detailed distribution of minimum expected work to be completed (Department-wise):-

a) <u>Oral Medicine & Radiology</u>

The Intern during his/her posting in oral surgery shall perform the following procedures (minimum requirement):

a) Standardized examination of patients 5 cases

b) Exposure to clinical, pathological laboratory procedures and biopsies/ 5 cases

c) cytology

d) Effective training in taking of Radiographs & processing : (Intra-oral) I.O, Full mouth and (Extra oral) E.O

e) Cephalogram – with interpretation 1

f) Interpretation of X-rays 25 nos.

g) Orientation to additional investigation techniques like CT Scan/MRI/ Sialography / USG/ Doppler- (optional : where there is scope/ facility)

b) <u>Oral and Maxillofacial surgery</u>

A. An Intern during his/her posting in oral surgery shall perform the following procedures (minimum requirement):

a) Extractions 50

b) Trans-alveolar extractions 2

c) Assisting / observing & other minor surgery 2

B. the Intern shall perform the following on Cancer Patients (preferential)

a) Maintain file work

b) Do extractions for radiotherapy cases

*

c) Perform biopsies

d) Observe varied cases of oral cancers

C. An intern shall have 15 days posting in emergency services of a dental/ dental wing of general hospital with extended responsibilities in emergency dental care in the wards. During this period he/she shall attend to emergencies under the direct supervision of oral & maxillofacial surgeon. Emergencies to be assisted and observed:

a) Toothache
b) Trigeminal neuralgia
c) Bleeding from mouth due to trauma, post extraction, bleeding disorder or haemophilia
d) Airway obstruction due to fracture mandible and maxilla; dislocation of mandible; syncope or vasovagal attacks; Ludwig's angina; tooth fracture; post intermaxillary fixation after general Anaesthesia.
e) observes the work in I.C.U. with particular reference to resuscitation procedures.
f) conducts tutorials on medico-legal aspects including reporting on actual cases coming to casualty.

c) <u>Prosthodontics and Crown & Bridge</u>

The interns during their internship posting in Prosthodontics shall perform the following procedures (minimum requirement):

a) Complete denture (upper & lower) (Clinical Procedures & laboratory work) 3 Cases
b) Removable Partial Denture (Clinical Procedures & laboratory work) 4 Cases
c) Planned (cast) partial denture (designing on model only) 1 Case
d) Learning use of Face bow and Semi anatomic articulator technique
e) Management of TMD cases etc.(preferable)
f) Miscellaneous-like Reline/Rebasing / Overdenture/ repairs of Denture/immediate complete denture.

d) <u>Periodontics</u>

An intern shall perform the following procedures (minimum requirement):

A. Prophylaxis 10 cases
B. Assist / observe or perform :

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a) Flap Operation 2 cases
b) Root Planning 1 case
c) Currettage 1 case
d) Gingivectomy 1 case
e) Perio-Endo cases 1 case

e) <u>Conservative Dentistry& Endodontics</u>

To facilitate reinforcement of learning and achievement of basic skills, the interns shall perform at least the following procedures independently or under the guidance of supervisors (minimum requirement):

a) Routine Restoration work 40 cases
b) Restoration of extensively mutilated teeth 2 cases
c) inlay and onlay preparations 1 case
d) Use of tooth colored restorative materials 4 cases
e) Treatment of discolored vital and non-vital teeth 1 case each
f) Management of pulpless, single-rooted teeth without periapical lesion 1 case
g) Management of acute dentoalveolar Infections 4 cases / as per availability
h) Management of pulpless, single-rooted tooth with periapical lesion 1 case
i) Non-surgical management of traumatised teeth during formative period. 1 case

f) <u>Paediatric and Preventive Dentistry</u>

During their posting in Paediatric Dentistry the intern shall perform (minimum requirement):

a) Topical application of fluorides 5 cases
b) Oral prophylaxis 10 cases
c) Restorative procedures of carious deciduous teeth in children 10 cases
d) Pulpotomy / Pulpectomy 1 case
e) Management of traumatized permanent anterior teeth (RCT) 1 case
f) Fabrication and insertion of Preventive /Interceptive orthodontic appliances 2 cases
g) Extractions 30 cases
h) Minor oral surgical procedures

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i) (Surgical exposure of unerupted teeth, mucocoele excision, frenectomy etc) 1 case

j) Management of Dento alveolar fractures 1 case

k) Management of Special children 2 cases

l) Comprehensive treatment including case discussion, maintenance of clinical records, Primary, secondary & tertiary levels of prevention including diet recording and diet counseling 1 case

g) <u>Oral Pathology and Oral Microbiology including Forensic Odontology</u>

An intern shall perform the following (minimum requirement):

a) History-recording and clinical examination 5 cases

b) Blood. Urine and Sputum examination 5 cases

c) Exfoliative Cytology and smears study 2 cases

d) Biopsy -Laboratory procedure & reporting 1 case

e) Preparation of ground section 2

Interns may also be posted in the Forensic Medicine Department of the attached Medical College.

h) <u>Orthodontics and Dentofacial Orthopaedics</u>

A. an intern shall observe the following procedures during their posting in Orthodontics (minimum requirement):

a) Detailed diagnostic procedures 5 patients

b) Laboratory techniques including wire-bending for removable appliances. Soldering and processing of myo-functional appliances.

c) Treatment plan options and decisions.

d) Making of bands, bonding procedures and wire insertions.

e) Use of extra oral anchorage and observation of force values.

f) Retention.

g) Observe handling of patients with oral habits causing malocclusions.

B. an intern shall do the following laboratory work (minimum requirement):

a) Wire bending for removable appliances and space-maintainers including welding and heat treatment procedure 5 cases

b) Soldering exercises, banding & bonding procedures 2 cases

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c) Cold-cure and heat-cure acrylisation of simple orthodontic Appliances 5 cases

C. an Intern shall carry out the following clinical work (minimum requirement):

a) Diagnosis and treatment plan including cephalometric analysis 5 cases
b) Fabrication of removable appliances with different problems 4 cases
c) Orthodontic impressions and bite-recordings. 5 cases

i) <u>Public Health Dentistry</u>

1. The intern shall conduct health education sessions for individuals and groups on oral health, public health nutrition, behavioural sciences, environmental health, preventive dentistry and oral epidemiology.
2. They shall conduct a short-term epidemiological survey in the community or in the alternate, participate in the planning and methodology
3. They shall arrange effective demonstration of (minimum requirement):

   a) Preventive and interceptive procedures for prevalent dental diseases.
   b) Mouth-rinsing and other oral hygiene demonstrations 5 cases
   c) Tooth brushing techniques 5 cases

4. Conduction of oral health education programmes at (minimum requirement):-
   a) School setting 2
   b) Community setting 2
   c) Adult education programmes 2

5. Preparation of Health Education materials 5
6. Exposure to team concept and National Health Care systems:

   a) Observation of functioning of health infrastructure.
   b) Observation of functioning of health care team including multipurpose; workers (male and female), health educators and other workers.
   c) Observation of atleast one National Health Programme.
   d) Observation of interlinkages of delivery of oral health care with Primary Health Care and visit to a water treatment plant.

   Mobile dental clinics should be made available for this training.

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j) Elective Posting

An Intern shall be posted for 20 days in any of the above clinical dental departments as per choice and availability.

2. Organisation of content

The Curriculum during the 4 ½ years of B.D.S. training is subject-based with more emphasis on learning practical skills. During one-year internship the emphasis will be on competency-based community-oriented training. The practical skills to be mastered by an intern along with the minimum performance level are given under the course content of different departments of Dental Education. The supervisors should see to it that proper facilities are provided in all departments and attached institutions for their performance.

3. Specification of teaching activities

Didactic lectures are delivered during the four and half years training in B.D.S. These shall be avoided. During the internship programme emphasis shall be on the chair-side teaching, small group teaching and discussions: tutorials, seminars, ward posting, laboratory posting, field visits and self-learning.

4. Use of Resource Materials

Overhead projectors, slide projectors, film projectors, charts, diagrams, photographs, posters, specimens, models and other audio-visual aids shall be provided in all the Dental Colleges and attached institutions and field areas. If possible, television and video tapes showing different procedures and techniques to be mastered by the internshould be provided. Use of computers/ advance facilities may be encouraged.

The intern shall submit minimum one educative chart/ model to any one department. The chart/model should have importance from the view of public awareness.

The intern shall prepare and submit minimum one scientific paper (Library dissertation) under the guidance of teacher by utilizing resources from library/ Internet etc.

5. Evaluation –

1. Formative Evaluation:

Day-to-day assessment of each intern during their internship posting should be done. The objective is that all the interns must acquire necessary minimum skills required for carrying out day-to-day professional work competently. This can be achieved by maintaining records and performance data book by each intern. This will not only

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provide a demonstrable evidence of the processes of training but also more importantly, of the intern's own acquisition of competencies as related to performance. It shall form a part of formative evaluation and shall also constitute a component of final grading of interns.

Cases treated by interns in respective department to be thoroughly observed and grades to be awarded on the same day by the in charge of the Internship Training Programme.

6. Skill Tests:

Evaluation systems shall assess the skills of candidates while performing clinical procedure over the patient during the course of treatment and during the posting in that department. Head of the Department and senior teacher of respective departments shall enlist minimum 10 skills relevant to that specialty and gradation to be given. Scoresto be given for performing not less than 5 skills with proficiency and to the satisfaction of the teacher. Maximum 5 marks for each skill and score less than 3 marks will be considered as unsatisfactory performance by the intern.

Gradation of each skill should be done as under:-

a)	Poor	1
b)	Below average	2
c)	Average	3
d)	Above average (Good)	4
e)	Excellent	5

If a candidate is declared as unsuccessful due to unsatisfactory performance in any of the Department he/ she shall be required to repeat the posting in continuation in that Department for a period as deemed fit by Head of the Department in consultation with Dean/ Principal.

Only after satisfactory performance of the skill during subsequent evaluation, the intern shall be eligible for award of internship completion certificate (refer section XII).

7. Summative Evaluation

It shall be based on the observations of the Head and supervising teachers of the Department. The final grading shall be done on the basis of records and performance log book maintained by the intern. In case of dispute, the Dean/Principal in consultation with the concerned Head of the Department and teacher in charge of Internship Training Programme shall take the decision, which shall be final and binding.

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5. ANNEXURE

5.1 Check List For Monitoring: Log Book, Seminar Assessment Etc. to be formulated by the Curriculum Committee of the Concerned Institution

5.2 Model Master time table for BDS

5.3 Format of Condonation register

5.4 Format for CRRI certificate

5.5 Model Question papers

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MODEL MASTER TIME TABLE FOR BDS

I BDS

Week days	8 am – 9 am	9 am -10 am	10 am -11 am	11 am -12 noon	12 noon -1 pm	1 pm -2 pm
Monday	Physiology	Anatomy	Biochemistry Practicals		Anatomy Practicals	
Tuesday	Dental Anatomy	Anatomy	Biochemistry	Physiology	Anatomy Practicals	
Wednesday	Biochemistry	Physiology	Physiology Practicals		Dental Anatomy Practicals	
Thursday	Dental Anatomy	Prosthodontics PC Practicals			Dental Materials Practicals	
Friday	Dental Anatomy Practicals		Dental Anatomy	Anatomy		Dental Materials
Saturday	C.D PC Practicals			Dental Anatomy Practicals		

II BDS

Week days	8 am – 9 am	9 am -10 am	10 am -11 am	11 am -12 noon	12 noon -1 pm	1 pm -2 pm
Monday	Pathology	Microbiology	Pharmacology Practicals		Pathology Practicals	
Tuesday	Microbiology	Pharmacology	Microbiology Practicals		Oral Pathology Practicals	
Wednesday	Pharmacology	Pathology	Orthodontics PC Practicals		Prosthodontics PC Practicals	
Thursday	Oral Pathology	Dental Materials Practicals		C.D PC	Prosthodontics PC Practicals	
Friday	Dental Materials	Dental Materials Practicals				Prosthodontics PC Praticals
Saturday	Dental Materials	CD PC Practicals		Prosthodontics PC	Orthodontics PC Practicals	

III BDS

Week days	8 am – 9 am	9 am -10 am	10 am -11 am	11 am -12 noon	12 noon -1 pm	1 pm -2 pm
Monday	Surgery	Medicine	Medicine Clinics			Oral Pathology
Tuesday	Medicine	Surgery	Surgery Clinics			OMR
Wednesday	Oral Pathology	Periodontics	Clinics			
Thursday	Pedodontics	Oral Pathology	OMFS	Clinics		
Friday	Prosthodontics	CD	Clinics			
Saturday	PHD	Orthodontics	PHD/OMFS	Oral Pathology Practicals		Prosthodontics PC Practicals

Final BDS Part I

Week days	8 am – 9 am	9 am -10 am	10 am -11 am	11 am -12 noon	12 noon -1 pm	1 pm -2 pm
Monday	OMR	Clinics				OMFS
Tuesday	PHD	Clinics				Pedodontics
Wednesday	Orthodontics	Clinics				
Thursday	Periodontics	Clinics				
Friday	CD	Clinics				
Saturday	Prosthodontics	Clinics				

Final BDS Part II

Week days	8 am – 9 am	9 am - 2 pm
Monday	OMFS	Clinics
Tuesday	CD	Clinics
Wednesday	Prosthodontics	Clinics
Thursday	Pedodontics	Clinics
Friday	Prosthodontics	Clinics
Saturday	OMFS	Clinics

At least 30% of theory classes to be handled by Assoc. Professors & above.

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Condonation register format

Page No.

Condonation Register

Name of

College:_____

Sl.No.	Name of Student	KUHS registration number of student	Year and date of request for availing condonation	Examination & subjects for which condonation is availed	Reason for condoning	Remarks	Dated Signature of the Principal

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Name of College of Dental Sciences

Emblem of College of Dental Sciences

Compulsory Rotating Resident Internship Certificate

This is to certify that_____ was a bona fide student of name of college for BDS course from_____ to _____. He/She passed the Final BDS Part II examination of the KERALA UNIVERSITY OF HEALTH SCIENCES, Thrissur, held in _____ and has successfully completed twelve months of Compulsory Paid Rotating Resident Internship Programme in various departments from _____to _____ as shown below:

Department	From	to	Extension Posting	
			From	to
Prosthodontics and Crown & Bridge	_____	_____	_____	_____
Conservative Dentistry& Endodontics	_____	_____	_____	_____
Oral & Maxillofacial Surgery	_____	_____	_____	_____
Periodontics	_____	_____	_____	_____
Public Health Dentistry	_____	_____	_____	_____
Paediatric & Preventive Dentistry	_____	_____	_____	_____
Orthodontics& Dentofacial Orthopaedics	_____	_____	_____	_____
Oral Medicine & radiology	_____	_____	_____	_____
Oral pathology& Oral Microbiology including Forensic Odontology	_____	_____	_____	_____
Elective (_____)	_____	_____	_____	_____

The character, conduct and professional performance of him/her during the period of training was _____.

Place:
Date: Office seal Principal

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QP Code: **Reg. No……**

First Year BDS Degree Examinations - Month Year

New Scheme (2016 admission onwards)

General Human Anatomy including Embryology and Histology

Time: 3hrs **Max Marks: 70**

- **Answer all questions**
- **Draw diagrams wherever necessary**

Essay: **(2x10=20)**

1. Describe the middle ear in detail under the following headings: • Shape and size • Parts and communications • Contents • Blood supply and nerve supply • Applied anatomy (2+2+3+2+1)
2. Describe the mandibular nerve in detail under the following headings: • Functional components • Course and relations • Branches and distribution • Applied anatomy (2+3+3+2)

Short notes **(4x5=20)**

3. Enumerate the para nasal sinuses and mention its functions. Where do each of them open. Mention its clinical importance. (2+2+1)
4. Describe the palatine tonsil under the following headings: • Location • Features • Blood supply (1+3+1)
5. Describe the tongue under the following headings: • External features • Extrinsic muscles. (2+3)
6. Describe the extra ocular muscles including: • Origin and insertion • Actions (3+2)

Brief notes: **(10x3=30)**

7. Sub mandibular ganglion
8. Microscopic structure of hyaline cartilage
9. Graafian follicle
10. Tentorium cerebelli
11. Inter peduncular fossa
12. Chromosomes
13. Bell's palsy
14. Pharyngeal pouches
15. Cavity of larynx
16. Structures within the parotid gland

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Reg. No……

First Year BDS Degree Examinations - Month Year
New Scheme (2016 admission onwards)
General Human Physiology and Biochemistry

Time: 3hrs **Max Marks: 70**

- Answer all questions
- Draw diagrams wherever necessary
- Write **section A** and **section B** in separate answer books (32 pages). Do not mix up questions from section A and section B

QP Code: **Section: A Physiology** **Max Marks: 35**

Essay: **(10)**

1. Enumerate the hormones secreted by pituitary gland. Discuss the actions of growth hormone. Add a note on disorders produced by hyper secretion of growth hormone. (2+6+2)

Short notes: **(2x5=10)**

2. Describe the endometrial changes during different phases of menstrual cycle, giving its hormonal basis. (3+2)
3. Draw a neat, labeled spirogram. Explain different lung volumes and capacities. (2+3)

Brief notes: **(5x3=15)**

4. Molecular basis of muscle contraction.
5. Chemical regulation of respiration
6. Factors influencing spermatogenesis
7. O_2-Hb Dissociation curve
8. Neuromuscular junction

QP Code: **Section: B Biochemistry** **Max Marks: 35**

Essay: **(10)**

9. What is the normal blood pH? Which are blood buffers? Explain renal regulation of blood pH. (1+2+7)

Short notes: **(2x5=10)**

10. Explain beta oxidation.
11. Classify jaundice and explain different types. Mention the laboratory findings for each category.

Brief notes: **(5x3=15)**

12. Deficiency diseases of vitamin A
13. BMR
14. Functions of calcium
15. Dietary fibers
16. Gout

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QP Code: **Reg. No……**

First Year BDS Degree Examinations - Month Year
New Scheme (2016 admission onwards)
Dental Anatomy, Embryology and Oral Histology

Time: 3hrs **Max Marks: 70**

- **Answer all questions**
- **Draw diagrams wherever necessary**

Essay: **(2x10=20)**

1. Enumerate and explain in detail the stages in the life cycle of ameloblast with the help of neat diagrams. (2+6+2)
2. Explain in detail the anatomy of permanent maxillary canine with neat diagrams. Add a note on its chronology. (8+2)

Short notes **(4x5=20)**

3. Cap stage of tooth development
4. Types of dentin
5. Permanent maxillary lateral incisor
6. Development of roots of the teeth

Brief notes: **(10x3=30)**

7. Enamel spindles
8. Nasmyth's membrane
9. Cell rests of Serre
10. Reciprocal induction
11. Reduced enamel epithelium
12. Perikymata
13. Hydrodynamic theory of tooth sensitivity
14. Traits in dentition
15. Three differences between permanent mandibular central and lateral incisor
16. Define : Cusp, cingulum & Mammelons

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QP Code: **Reg. No……**

Second Year BDS Degree Examinations - Month Year
New Scheme (2016 admission onwards)
Dental Materials

Time: 3hrs **Max Marks: 70**

- Answer all questions
- Draw diagrams wherever necessary
- Write **section A** and **section B** in separate answer books (32 pages). Do not mix up questions from section A and section B

QP Code: **Section: A Prosthodontics** **Max Marks: 35**

Essay: **(10)**

1. Define impressions in Prosthodontics. Classify Impression Materials. Enumerate in detail the composition, Properties and uses of any one elastic impression material. (2+3+5)

Short notes: **(2x5=10)**

2. Classify Dental casting investment materials. Explain in detail about Phosphate bonded investments. (2+3)
3. Enumerate the materials used as denture base resins. Add a brief note on curing cycle of denture base resins. (3+2)

Brief notes: **(5x3=15)**

4. CAD- CAM in Prosthodontics
5. Wrought metal alloys
6. Green stick impression compound
7. Stress and strain
8. Describe Hue , value and Chroma.

QP Code: **Section: B Conservative Dentistry** **Max Marks: 35**

Essay: **(10)**

9. Classify Dental Cements. Explain in detail the composition, properties ,manipulation and uses of Poly carboxylate cement. (3+2+2+2+1)

Short notes: **(2x5=10)**

10. ADA classification of Dental Casting Alloys. Describe in detail advantages and disadvantages of base metal alloys. (2+3)
11. Explain in detail various methods of trituration of amalgam and the setting reaction of amalagam. (3+2)

Brief notes: **(5x3=15)**

12. Classify casting defects
13. Composition and uses of Gutta percha
14. Rake angle
15. Inlay casting wax
16. Gold foil

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QP Code: **Reg. No……**

Second Year BDS Degree Examinations - Month Year
New Scheme (2016 admission onwards)
General & Dental pharmacology and therapeutics

Time: 3hrs **Max Marks: 70**

- Answer all questions
- Draw diagrams wherever necessary

Essay: **(2x10=20)**

1. Classify non-steroidal anti-inflammatory drugs. Mention the mechanism of action, adverse effects, and therapeutic uses of aspirin. (4+2+2+2)
2. Classify fluoroquinolones. Enumerate the mechanism of action, adverse effects, and therapeutic uses of ciprofloxacin. (4+2+2+2)

Short notes **(4x5=20)**

3. Classify the local anaesthetics. Explain the mechanism of action of lignocaine (3+2)
4. Classify diuretics and mention the mechanism of action of loop diuretics (3+2)
5. Classify oral hypoglycaemic agents. Mention the mechanism of action and adverse effects of glibenclamide. (3+2)
6. Classify antiseptics and mention its therapeutic applications. (3+2)

Brief notes: **(10x3=30)**

7. Therapeutic uses of digoxin.
8. Therapeutic uses and contraindications of adrenaline.
9. Intravenous general anesthetics
10. Explain briefly about the drugs used in helicobacter pylori therapy
11. Oral iron preparations
12. Mention four calcium channel blockers and its therapeutic uses
13. Explain about the local haemostatics
14. Explain the therapeutic uses of cotrimoxazole
15. Explain briefly on dentifrices
16. Mention the drugs used in insomnia and explain the mechanism of action

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Reg. No……

First Year BDS Degree Examinations - Month Year
New Scheme (2016 admission onwards)
General Pathology and General Microbiology

Time: 3hrs **Max Marks: 70**

- Answer all questions
- Draw diagrams wherever necessary
- Write **section A** and **section B** in separate answer books (32 pages). Do not mix up questions from section A and section B

QP Code: **Section: A General Pathology** **Max Marks: 35**

Essay: **(10)**

1. Define inflammation. Enumerate the chemical mediators of inflammation. Discuss the cellular events in acute inflammation. (2+3+5)

Short notes: **(2x5=10)**

2. Classify anemia. Discuss the peripheral smear picture in iron deficiency anemia. (2+3)
3. Describe healing by primary intention with the help of a diagram. Mention four complications of wound healing. (4+1)

Brief notes: **(5x3=15)**

4. Pathologic classification
5. Septic shock
6. Giant cell tumor
7. Metastatic cascade
8. Actinomycosis

QP Code: **Section: B General Microbiology** **Max Marks: 35**

Essay: **(10)**

9. Define and classify sterilization. Describe moist heat sterilization (2+3+5)

Short notes: **(2x5=10)**

10. Describe the pathogenesis and laboratory diagnosis of Syphilis. (2+3)
11. Define hypersensitivity and types of Hypersensitivity reaction. Describe the mechanism of anaphylaxis. (1+2+2)

Brief notes: **(5x3=15)**

12. Candidiasis
13. Laboratory diagnosis of Diphtheria
14. Classical compliment pathway
15. Drug resistance
16. Laboratory diagnosis of HIV

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QP Code: **Reg. No……**

Third Year BDS Degree Examinations - Month Year
New Scheme (2016 admission onwards)
Oral pathology and Microbiology

Time: 3hrs **Max Marks: 70**

- **Answer all questions**
- **Draw diagrams wherever necessary**

Essay: **(2x10=20)**

1. Classify odontogenic tumors. Discuss the clinical & radiographic features & histopathology of ameloblastoma. (3+2+1+4)
2. Define Dental Caries. Describe the types & histopathology of dentinal caries. (2+4+4)

Short notes **(4x5=20)**

3. What is amelogenesis imperfecta. Discuss the causes of enamel hypoplasia. (1+4)
4. Grading and histopathology of oral squamous cell carcinoma. (1+4)
5. Discuss the radiographic features and histopathology of dentigerous cyst . (2+3)
6. Age estimation (5)

Brief notes: **(10x3=30)**

7. Actinomycosis
8. Dysplasia
9. Oral thrush
10. Tzanck cells
11. Focal infection
12. Clinical features of Pagets disease
13. Histopathology of lichen planus
14. Investigation of sjogren syndrome
15. Radiographic features of osteosarcoma
16. Hemophilia

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QP Code: **Reg. No……**

Third Year BDS Degree Examinations - Month Year
New Scheme (2016 admission onwards)
General Medicine

Time: 3hrs **Max Marks: 70**

- **Answer all questions**
- **Draw diagrams wherever necessary**

Essay: **(2x10=20)**

1. Discuss the etiology, clinical manifestations, investigations and treatment of thyrotoxicosis. (2+5+2+1)
2. Define heart failure. Discuss the etiology, pathogenesis, clinical manifestations, diagnosis and treatment of heart failure. (1+2+1+3+2+1)

Short notes **(4x5=20)**

3. Discuss the clinical features, diagnosis and treatment of lung abscess.(2+2+1)
4. Discuss the etiology, clinical features, investigations and treatment of acute adrenal insufficiency. (1+2+1+1)
5. Discuss the classification & diagnosis of diabetes mellitus and mention the oral hypoglycemic agents in brief. (1+2+2)
6. Describe in detail the etiology, clinical features, investigations and treatment of enteric fever. (1+1+2+1)

Brief notes: **(10x3=30)**

7. Migraine
8. Amoebiasis
9. Hypocalcaemia
10. Anticonvulsant drugs
11. Anaphylactic shock
12. Osteomalacia
13. Fallot's tetralogy
14. Nephrotic syndrome
15. Mumps
16. Sleep apnea

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QP Code: **Reg. No……**

Third Year BDS Degree Examinations - Month Year
New Scheme (2016 admission onwards)
General Surgery

Time: 3hrs **Max Marks: 70**

- **Answer all questions**
- **Draw diagrams wherever necessary**

Essay: **(2x10=20)**

1. Classify salivary tumors. Discuss the pathology, clinical features, investigations and treatment of pleomorphic adenoma. (3+2+3+1+1)
2. Classify shock. Discuss the clinical features and management of septic shock (2+5+3)

Short notes **(4x5=20)**

3. What is reactionary haemorrhage and how do you manage it. Mention the indications and complications of massive blood transfusion (2+1+2)
4. Classify wounds. Discuss the management of wounds (3+2)
5. Discuss the pathology, investigations and treatment of tuberculous cervical lymphadenitis (2+1+2)
6. Discuss briefly the development, arterial supply and venous drainage of thyroid gland. (3+2)

Brief notes: **(10x3=30)**

7. Ranula
8. Brachytherapy
9. Robert Koch
10. Fine needle aspiration cytology
11. Sternomastoid tumor
12. Branchial cyst
13. Keloid
14. Medullary carcinoma of thyroid
15. Ludwig's angina
16. Informed consent

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QP Code: **Reg. No……**

Final Year BDS (Part I) Degree Examinations - Month Year
New Scheme (2016 admission onwards)
Public Health Dentistry

Time: 3hrs **Max Marks: 70**

- **Answer all questions**
- **Draw diagrams wherever necessary**

Essay: **(2x10=20)**

1. Define health education. Add a note on principles and approaches in health education (2+4+4)
2. Define water fluoridation. Enumerate and describe in detail various systemic fluoridation methods. (3+7)

Short notes: **(4x5=20)**

3. Changing concepts in public health
4. Biomedical waste management
5. Define primary health care. Add a note on principles of primary health care.
6. Describe prevention of dental caries based on levels of prevention.

Brief notes: **(10x3=30)**

7. Turku sugar study
8. WHO index age groups and its significance.
9. Prevention and management of pressure sores.
10. Principles of ethics
11. Mobile dental van
12. Normal curve
13. Management of oral conditions in chronic/terminal illness
14. School Dental Nurse
15. Balanced diet
16. Percentile

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QP Code: **Reg. No……**

Final Year BDS (Part I) Degree Examinations - Month Year
New Scheme (2016 admission onwards)
Periodontology

Time: 3hrs **Max Marks: 70**

- **Answer all questions**
- **Draw diagrams wherever necessary**

Essay: **(2x10=20)**

1. Define localized aggressive periodontitis. Explain the clinical features, radiographic features and treatment of localized aggressive periodontitis. (1+2+2+5)
2. Classify bone grafts. Explain in detail the various bone graft materials used in periodontics. (3+7)

Short notes: **(4x5=20)**

3. Explain the procedure of external bevel gingivectomy.
4. Classify periodontal pocket. Briefly describe the signs and symptoms of periodontal pocket.
5. Free gingival autograft.
6. Treatment of Class II furcation involvement.

Brief notes: **(10x3=30)**

7. Radius of action.
8. Factors determining the probing depth.
9. Steps in Resective osseous surgery.
10. DNA probe.
11. Plaque hypotheses.
12. Stages of gingivitis.
13. Pericoronitis.
14. Interdental cleansing aids.
15. Chlorhexidine.
16. Pyogenic granuloma.

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QP Code: **Reg. No……**

Final Year BDS (Part I) Degree Examinations - Month Year

New Scheme (2016 admission onwards)

Orthodontics and Dentofacial Orthopedics

Time: 3hrs **Max Marks: 70**

- **Answer all questions**
- **Draw diagrams wherever necessary**

Essay: **(2x10=20)**

1. Define interceptive orthodontics. Enumerate various interceptive orthodontic procedures. Discuss serial extraction in detail. (2+2+6)
2. An 11 year old girl was brought to your clinic by her mother complaining of protruded upper teeth, on examination there was convex profile, incompetent lips and increased overjet. Cephalometric findings showed an SNA of 83, ANB of 6 degree and FMA of 26 degrees. What is your diagnosis? Write a note on treatment plan and elaborate on mechanotherapy. (3 +2+ 5)

Short notes: **(4x5=20)**

3. Methods to reinforce anchorage
4. CVMI
5. Therapeutic extractions
6. Merits and demerits of Angle's Classification

Brief notes: **(10x3=30)**

7. EH Angle
8. Six keys to normal occlusion
9. Moment to force ratio
10. Modifications of Adams Clasp
11. Rule of 10 in CLCP management
12. Twin study
13. Elements of Valid consent
14. Schools of retention
15. List essential diagnostic aids
16. VTO

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QP Code: **Reg. No……**

Final Year BDS (Part I) Degree Examinations - Month Year

New Scheme (2016 admission onwards)

Oral Medicine & Radiology

Time: 3hrs **Max Marks: 70**

- **Answer all questions**
- **Draw diagrams wherever necessary**

Essay: **(2x10=20)**

1. Classify white lesions of oral cavity. Mention about etiopathogenesis, Clinical features, investigations and management of oral submucous fibrosis. (4+1+2+1+2)
2. Write in detail about faulty radiographs and methods of rectification of faults. (5+ 5)

Short notes: **(4x5=20)**

3. Trigeminal neuralgia
4. Sialolithiasis
5. Bisecting angle technique
6. Latent image

Brief notes: **(10x3=30)**

7. Vital staining
8. Penny test
9. Ely's cyst
10. Intensifying screens
11. James- Ramsey Hunt syndrome
12. Radiographic features of fibrous dysplasia
13. TNM staging for oral cancer
14. Dosimeters
15. Antifungal agents
16. Image receptors

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QP Code: **Reg. No……**

Final Year BDS (Part II) Degree Examinations - Month Year

New Scheme (2016 admission onwards)

Prosthodontics

Time: 3hrs **Max Marks: 70**

- **Answer all questions**
- **Draw diagrams wherever necessary**

Essay: **(2x10=20)**

1. Define Centric Relation. Explain the various techniques for recording centric relation. Describe the importance of centric relation in complete denture treatment. (2+5+3)
2. Classify Direct retainers. Explain in detail the parts of a circumferential clasp. Describe the functions of each component of the clasp. (3+3+4)

Short notes: **(4x5=20)**

3. Define and Classify pontics. (1+4)
4. Describe the principles of tooth preparation.
5. Post insertion complaints of complete denture treatment.
6. Maxillofacial prosthetic materials.

Brief notes: **(10x3=30)**

7. Obturator.
8. Indirect retention.
9. Combination syndrome.
10. Osseointegration.
11. Denture stomatitis.
12. Kennedy's Classification.
13. Colour coding in RPD designing.
14. Gingival retraction.
15. Digital impressions in prosthodontics.
16. Compensatory curves.

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QP Code: **Reg. No……**

Final Year BDS (Part II) Degree Examinations - Month Year
New Scheme (2016 admission onwards)
Oral and Maxillofacial Surgery

Time: 3hrs **Max Marks: 70**

- **Answer all questions**
- **Draw diagrams wherever necessary**

Essay: **(2x10=20)**

1. Describe nerve conduction and mechanism of action of local anesthetics. Enumerate theories of local anesthesia. Classify local anesthetics based on their action. (2+2+3+3)
2. Classify mandibular fractures. Describe clinical features, diagnosis and management of displaced angle fracture. (2+2+2+4)

Short notes: **(4x5=20)**

3. Describe clinical features, diagnosis and management of trigeminal neuralgia
4. Discuss the importance of pre-anaesthetic evaluation before administration of general anaethesia
5. Describe clinical features, diagnosis and management of pterygomandibular space infection
6. Describe landmarks and technique of infra orbital nerve block. Add a note on the possible complications of infra orbital nerve block.

Brief notes: **(10x3=30)**

7. CPR
8. Principles of antimicrobial therapy in OMFS
9. Chronic oro-antral fistula
10. Genioplasty
11. Osteoradionecrosis
12. Dry Socket
13. Autoclave
14. Fine needle aspiration cytology
15. Trismus
16. Dental investigations in mass disaster incidents

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QP Code: **Reg. No……**

Final Year BDS (Part II) Degree Examinations - Month Year
New Scheme (2016 admission onwards)
Pediatric and Preventive Dentistry

Time: 3hrs **Max Marks: 70**

- **Answer all questions**
- **Draw diagrams wherever necessary**

Essay: **(2x10=20)**

1. What is the concept of a Dental Home? Define anticipatory guidance and chart out the anticipatory guidance of children age wise. (3+2+5)
2. Discuss the Ellis and Davey classification of dental trauma. Explain the emergency oral soft tissue injury management and management of fractured permanent incisors without pulp exposure. (3+3+4)

Short notes: **(4x5=20)**

3. List out the various fixed space regainers and explain briefly on Gerber space regainer.
4. Define defluoridation. Outline the types of defluoridation techniques
5. Explain in detail diet counseling in a child with ECC.
6. What are the clinical features of a child with Down syndrome. Outline dental management of this child in the clinic.

Brief notes: **(10x3=30)**

7. AAPD definition of dental neglect and role of dentist in child abuse
8. Stainless Steel Crowns- composition and types
9. Causes of delayed eruption of teeth
10. Uses of hypnodontics
11. Storage media for avulsed teeth
12. Causes of midline diastema
13. Primate space and Leeway space of Nance
14. Tongue blade Therapy
15. Frankl Rating Scale
16. Define oral habits. Management of a child with lip biting.

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QP Code: **Reg. No……**

Final Year BDS (Part II) Degree Examinations - Month Year

New Scheme (2016 admission onwards)

Conservative dentistry and Endodontics

Time: 3hrs **Max Marks: 70**

- **Answer all questions**
- **Draw diagrams wherever necessary**

Essay: **(2x10=20)**

1. Define working length. Enumerate the methods of working length determination. Discuss in detail radiographic technique (2+3+5)
2. What are the methods of isolation of operating field. Discuss the significance of isolation with respect to the various materials used (6+4)

Short notes: **(4x5=20)**

3. Rationale of endodontics
4. Principles of cast restorations
5. What re the principles of biomechanical preparation
6. Classify hand cutting instruments in operative dentistry. Discuss instrument formula

Brief notes: **(10x3=30)**

7. Pulp polyp
8. Bevels
9. Standardisation of endodontic instruments
10. Retention form in amalgam
11. Cavity liners
12. Sodium hypochlorite
13. Thermal test
14. Flaps in surgical endodontics
15. Metal modified glass ionomer
16. Pins used with amalgam

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REGULATIONS 2016

SYLLABUS

for Courses affiliated to the

Kerala University of Health Sciences

Thrissur 680596

Master of Dental Surgery (MDS)

Prosthodontics and Crown and Bridge

Course Code: 241

(2016-17 Academic year onwards)

2. COURSE CONTENT

2.1 Title of course:

MDS Prosthodontics and Crown and Bridge

2.2 Objectives of course

1. Goals

The goals of postgraduate training in various specialities are to train the BDS graduate who will:

- Practice respective specialty efficiently and effectively, backed by scientific knowledge and skill.
- Exercise empathy and a caring attitude and maintain high ethical standards.
- Continue to evince keen interest in continuing professional education in the specialty and allied specialties irrespective of whether in teaching or practice.
- Willing to share the knowledge and skills with any learner, junior or a colleague.
- To develop the faculty for critical analysis and evaluation of various concepts and views, to adopt the most rational approach.

2. Objectives

The objective is to train a candidate so as to ensure higher competence in both general and special area of interest and prepare him for a career in teaching, research and specialty practice. A candidate must achieve a high degree of clinical proficiency in the subject matter and develop competence in research and its methodology as related to the field concerned.

The above objectives are to be achieved by the time the candidate completes the course. The objectives may be considered as under –

1. Knowledge (Cognitive Domain)
2. Skills (Psychomotor Domain)
3. Human values, ethical practice and communication abilities.

2.1. Knowledge

- Demonstrate understanding of basic sciences relevant to the specialty.
- Describe etiology, pathophysiology, principles of diagnosis and management of common problem within the specialty in adults and children.
- Identify social, economic, environmental and emotional determinants in a given case and take them into account for planning treatment.
- Recognize conditions that may be outside the area of specialty/competence and to refer them to an appropriate specialist.
- Update knowledge by self-study and by attending courses, conferences and seminars relevant to specialty.

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- Undertake audit; use information technology and carry out research both basic and clinical with the aim of publishing or presenting the work at various scientific gatherings.

2.2. Skills

- Take a proper clinical history, examine the patient, perform essential diagnostic procedures and order relevant tests and interpret them to come to a reasonable diagnosis about the condition.
- Acquire adequate skills and competence in performing various procedures as required in the specialty.

2.3. Human values, ethical practice and communication abilities

- Adopt ethical principles in all aspects of practice.
- Foster professional honesty and integrity.
- Deliver patient care, irrespective of social status, caste, creed, or religion of the patient.
- Develop communication skills, in particular skill to explain various options available in management and to obtain a true informed consent from the patient.
- Provide leadership and get the best out of his team in congenial working atmosphere.
- Apply high moral and ethical standards while carrying out human or animal research.
- Be humble and accept the limitations in his knowledge and skill and to ask for help from colleagues when needed.
- Respect patient's rights and privileges including patient's right to information and right to seek a second opinion.

2.3 Medium of instruction:

The medium of instruction for the course shall be English.

2.4 Course outline

Prosthodontics is the dental specialty pertaining to the diagnosis, treatment planning, rehabilitation and maintenance of the oral function, comfort, appearance and health of patients with clinical conditions associated with missing or deficient teeth and/or maxillofacial tissues using biocompatible substitutes.

2.5 Duration

The course shall be of **three years** duration. All the candidates for the degree of MDS are required to pursue the recommended course for at least three academic years as full time candidates in an institution affiliated to and approved for Postgraduate studies by KUHS, observing the norms put

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forward by theca.

i. There will be no reduction for the course duration for any of the students including service candidates, diploma holders and those who have done senior house surgeoncy or equivalent research experience.
ii. No student shall be permitted to complete the course by attending more than 6 continuous years.
iii. A candidate selected for admission in a Dental College is obliged to follow the curriculum, rules and regulations as approved by the Dental Council of India and the University. Curriculum, rules or regulations are subject to changes from time to time.

2.6 Syllabus

Course Contents
Syllabus for MDS PROSTHODONTICS AND CROWN & BRIDGE

A strict division of the subject may not be possible and some overlapping of subjects is inevitable.

Students should be prepared to answer overlapping subjects.

The concept of health care counseling shall be in corporated in all relevant areas

The MDS theory examination consist of four papers

Paper I - Applied Anatomy, Physiology, Pathology and Dental Materials

Paper-II- Removable Prosthodontics and Oral Implantology
Paper-III- Fixed Prosthodontics

Paper-IV -Essay

PAPER I - Applied Anatomy, Physiology, Pathology and Dental Materials

1. Applied General Anatomy of the Head and Neck, Oral and Dental Anatomy and Histology.

1.1. Embryology

1.1.1. Early embryology, development up to the appearance of the three primary germ layers.
1.1.2. Histogenesis and organogenesis.
1.1.3. Post natal growth and development of bony and soft tissue structure of the head and neck.
1.1.4. Development of Branchial arches, Pharyngeal pouches & cleft

1.2. Applied General Anatomy

1.2.1. Osteology of facial bones.
1.2.2. Face – Facial Muscles, Nerve supply, Blood supply, Lymphatic drainage.
1.2.3. Myology – Muscles of Facial Expression, Mastication
1.2.4. Cranial Nerves (5,7)
1.2.5. Salivary glands.

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1.2.6. Palate
1.2.7. Anatomy of Tongue – muscles, blood and nerve supply.
1.2.8. TM Joint – Movements, relations, anomalies and age changes.

1.3.Oral and Dental Anatomy

1.3.1. Morphology of individual teeth in primary and permanent dentition with variations.
1.3.2. Occlusion, dental arch formation, development of occlusion from gum pads, deciduous, mixed and permanent dentition.
1.3.3. Sequence of eruption.
1.3.4. Tooth Numbering Systems

1.1. General Histology

1.4.1. Different types of epithelium
1.4.2. Bone

1.5. Oral Histology

1.5.1. Histology of developing tooth germ, enamel, dentin, cementum, periodontal ligament, pulp, alveolar bone, oral mucous membrane, salivary glands, gingival, gingival sulcus and epithelial attachment.
1.5.2. ENAMEL: Physical characteristics, chemical properties, structure clinical considerations. age changes.
1.5.3. DENTIN: Physical characteristics, chemical properties, structure. Types of dentin. Dentin innervation and hypersensitivity.
1.5.4. CEMENIUM: Physical characteristics, chemical properties, structure. Clinical consideration. Age changes.
1.5.5. PERIODONTAL LIGAMENT: Cells and fibers. Functions. Clinical Considerations. Age Changes.
1.5.6. ALVEOLAR BONE: Physical characteristics, chemical properties and structure

2. Applied General and Oral Physiology

2.1 General principles of Human Physiology.
2.2 Blood - Composition & functions
2.3 Anemia - Definition, classification, life span of RBC's destruction of RBC's, formation & fate of bile pigment
2.4. Haemostasis – Role of vasoconstriction, platelet plug formation in haemostasis, coagulation factors, intrinsic & extrinsic pathways of coagulation, clot retraction.
2.5. Hemorrhage
2.6. Blood Pressure – Definition, normal values, variations, determinants. Control and Maintenance.
2.7 Hemorrhage and Shock.

3. Applied Pharmacology and therapeutics

3.1 Mechanism of drug action.
3.2 Mechanism of Detoxication in the Body.
3.3 Intolerance, Tolerance, Cumulative action, Synergism, Antagonism.
3.4 Dosage, Classification of Drugs.
3.5 Local Anesthetics.

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3.6 Analgesics
3.7 Antiseptics and Disinfectants.

4. Applied General and Oral Pathology and Microbiology.

4.1 Cellular adaptation, Cellular degeneration, Apoptosis, Oncosis, Necrosis, Gangrene, Pathologic calcification
4.2 Intracellular accumulations – Fatty changes, deposition of proteins, glycogen
4.3 Detailed study of Inflammation - Definition, Vascular phenomena, Inflammatory Exudates, Localization of infection, Tissue changes in inflammation and variations of Inflammation.
4.4 Healing, Regeneration, Repair Mechanisms, Healing by primary intention, Healing by secondary intention, Fracture healing, Factors influencing healing process, Complications. Healing of a wound – organization, parenchymal repair, healing of a socket after extraction
4.5 Hemorrhage and Shock.
4.6 Atrophy, Hypertrophy, Hyperplasia, Metaplasia, Dysplasia
4.7 Anaemia - classification, Iron Deficiency anaemia, Megaloblastic anaemia, Hemolytic anaemias
4.8 Coagulation cascade
4.9 Dental caries – Etiology, histopathology, clinical characteristics and sequelae.
4.10 Pulpitis – Etiology, Pathology and sequelae of Acute and Chronic Pulpitis.
4.11 Acute apical periodontitis and dentoalveolar abscess.
4.12 Topography of root ends and surrounding structures, relationship between maxillary teeth and maxillary sinus.

5.Microbiology

5.1 Infection Control
5.2 Sterilization with special reference to dental office. Sterilization and Asepsis.
5.3 Hand washing and hand hygiene.
5.4 Personal protective equipments.
5.5 Handling of sharp instruments.
5.6 Needle-stick injury, exposure to body fluids. .
5.7 Post-exposure prophylaxis.
5.8 Management and disposal of waste.

6. RESEARCH METHODOLOGY, BIOSTATISTICS

6.1 Research Methodology

6.1.1 What is research ?
6.1.2 What is research methodology
6.1.3 Study Designs
6.1.3.1 Epidemiological studies, Observations, Descriptive, Cohort case control studies.
6.1.3.2 Experimental, Clinical trials (Randomized control), Community trends (Non randomized)

6.2 Biostatistics

6.2.1 Introduction to Biostatistics – Application of statistics on Dental Health.
6.2.2 Descriptive statistics – Definition, Presentation of Statistics, Measures of Central tendency – measures of Dispersion, Normal distribution, Binomial Distribution

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6.2.3 Collection, compilation, and graphical representation of statistical data, techniques of sampling, bias in sampling.

6.2.4 Inferential statistics – Testing of Hypothesis, standard error, t-test, Z-test, chi square test, Analysis of Variance, "U" test.

6.2.5 Correlation and Regression.

7. Dental Radiology

7.1. Introduction
7.2. Sources
7.3. Principles of x-ray production
7.4. Radiographic Principles and Techniques
7.5. Recent advances in imaging, viz., Digital imaging,CBCT etc

8. Medical Emergencies & Management

8.1. Prevention – Introduction, Prevention, Preparation, Medico legal considerations
8.2. Unconsciousness - general considerations, Vasodepressor syncope, Postural hypotension,
8.3. Diabetes mellitus – hyperglycemia and hypoglycemia

9. Ethics in Dentistry

9.1 Introduction to ethics:
- 9.1.1 What is ethics?
- 9.1.2 What are values and norms?
- 9.1.3 How to form a value system in one's personal and professional life?
- 9.1.4 Hippocratic oath.

9.2 Ethics of the Individual
- 9.2.1 The patient as a person
- 9.2.2 Right to be respected
- 9.2.3 Truth and confidentiality
- 9.2.4 Autonomy of decision
- 9.2.5 Doctor patient relationship

9.3 Professional Ethics
- 9.3.1 Code of conduct
- 9.3.2 Contract and confidentiality

10.APPLIED DENTAL MATERIAL SCIENCES

10.1Introduction

10.2. Structure of matter.

10.3. Physical properties of dental materials

10.4. Mechanical properties of dental materials

10.5. Biocompatibility of dental materials.

10.6. Hydrocolloid Impression materials

10.7. Non aqueous elastomeric impression materials.

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10.8. Inelastic impression material

10.9. Gypsum products

10.10. Synthetic resins

10.11. Denture base resins

10.12. Restorative resin

10.13. Bonding

10.14. Solidification and micro structure of metals

10.15. Constitution of alloys

10.16. Corrosion

10.17. Dental casting alloys & metals

10.18. Inlay casting wax

10.19. Investments

10.20. Casting procedure

10.21. Dental cements

10.22. Ceramics

10.23. Soldering

10.24. Wrought base metal & gold alloys

10.25. Dental implant materials

10.26. Maxillofacial prosthetic materials

10.27. Lasers in dentistry

10.28. Finishing & polishing materials

10.29. Mechanics of cutting with dental burs

10.30. Recent developments in dental materials

10.31. Materials used for the treatment of craniofacial disorders –

Clinical, treatment and Laboratory materials, Associated materials, Technical consideration, shelf life, storage, manipulation, sterilization and waste management.

PAPER II - Removable Prosthodontics and Oral Implant ology.

1.1. REMOVABLE COMPLETE PROSTHODONTICS

1.1.1.Introduction

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1.1.2. Applied anatomy and physiology of oral and maxillofacial region including age changes

1.1.3. Diagnosis and Treatment planning

1.1.4. Residual ridge resorption

1.1.5. Mouth preparation

1.1.6. Impression procedures including the various theories of impression making.

1.1.7. Maxillo-mandibular relations.

1.1.8. Mandibular movements.

1.1.9. Articulators and Face Bows.

1.1.10. Selection and arrangement of teeth.

1.1.11. Occlusion

1.1.12. Verification of the jaw relations

1.1.13. Processing and finishing of Complete Dentures

1.1.14. Laboratory remount

1.1.15. Denture insertion

1.1.16. Clinical remount and recall checkup

1.1.17. Troubleshooting

1.1.18. Repair, relining and rebasing.

1.1.19. Duplication of denture

1.1.20. Immediate denture

1.1.21. Single complete denture

1.1.22. Overdenture

1.1.23. Principles of Aesthetics including characterization of denture.

1.1.24. Infection control and biomedical waste management in Prosthodontics.

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1.2. Removable Partial Denture

1.2.1. Introduction
1.2.2. Classification of partially edentulous situation
1.2.3. Examination, diagnosis, treatment planning
1.2.4. Components of removable partial denture
1.2.5. Principles of RPD, forces acting on RPD, control of stresses
1.2.6. Surveyor
1.2.7. Surveying Principles, procedure and designing
1.2.8. Mouth preparation
1.2.9. Impressions for distal extension RPD
1.2.10. Jaw Relations
. 1.2.11. Laboratory procedure
1.2.12. Insertion and post insertion follow up
1.2.13. Failures in RPD.
1.2.14. Repair lining.
1.2.15. Immediate RPD.
1.2.16. Transitional Denture.
1.2.17. Interim denture.
1.2.18. Dental Material aspects related to RPD.

1.3 Oral Implantology

1.3.1 Implant Supported Partial Dentures
1.3.2 Introduction and Terminology
1.3.3 Diagnosis and treatment Planning
1.3.4 Classification of Prostheses
1.3.5 Biomechanics in Oral Implantology
1.3.6 Cement retained and Screw retained prostheses.
1.3.7 Principles of Occlusion in Implantology.
1.3.8 Progressive Bone loading
1.3.9 Immediate Load applications in Implant dentistry
1.3.10 Implantology related to implant supported Overdentures.
1.3.11 Implantology related to maxillofacial prosthetics.
1.3.12 Failures in implant supported fixed partial dentures
1.3.13 Recent advances in implantology
1.3.14 Maintenance and Hygiene.

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1.4 Maxillofacial Rehabilitation

1.4.1 Scope, terminology and definitions.
1.4.2 Behavioral and psychological issues in Head and neck cancer,
Psychodynamic interactions - clinician and patient
Cancer Chemotherapy: Oral Manifestations, Complications, and management,
Radiation therapy of head and neck tumors: Oral effects, Dental manifestations and dental treatment:
Etiology, treatment and rehabilitation (restoration)- Acquired defect of the mandible, acquired defects of hard palate, soft palate
Clinical management of edentulous and partially edentulous maxillectomy patients, Facial defects,
Restoration of speech, Velopharyngeal function, cleft lip and palate, cranial implants maxillofacial trauma, Lip and cheek support prosthesis,
Laryngectomy aids, Obstructive sleep apnoea, Tongue prosthesis, Esophageal prosthesis,
Vaginal radiation carrier, Burn stents, Nasal stents, Auditory inserts,
Trismus appliances, mouth controlled devices for assisting the handicapped
Custom prosthesis for lagophthalomos of the eye. Osseointegrated supported facial and maxillofacial prosthesis. Resin bonding for maxillofacial prosthesis,
Implant rehabilitation of the mandible compromised by radiotherapy,
Craniofacial Osseointegration, Prosthodontic treatment,
Material and laboratory procedures for maxillofacial prosthesis.

1.5 Maxillofacial Prosthetics
1.5.1 Obturators
1.5.2 Occlusal splints
1.5.3 Gunning Splint
1.5.4 Guiding Flange appliance
1.5.5 Other prostheses like ocular prosthesis, finger prosthesis, ear prosthesis, etc.
1.5.6 Dental Material aspects related to Maxillofacial prosthetics.

2. PAPER III - FIXED PARTIAL PROSTHODONTICS, OCCLUSION, TMJ AND AESTHETICS

2.1. Tooth Supported Fixed Partial Dentures
2.1.1. Introduction
2.1.2. Diagnosis and treatment planning
2.1.3. Occlusion in detail
2.1.4. Mandibular movements, occlusal correction
2.1.5. Articulators and face –bow
2.1.6. Classification of FPD and parts of FPD
2.1.7. Retainers – Classification, Indications
2.1.8. Selection of Retainers
2.1.9. Principles of tooth preparations
2.1.10. Preparation of vital and endodontically treated teeth to receive various retainers
2.1.11. Fluid control and soft tissue management.
2.1.12. Preparation of special tray and impression making
2.1.13. Preparation various dies

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2.1.14. Maxillomandibular relations and relating them to articulators.
2.1.15. Laboratory procedures including preparation of wax pattern, casting and finishing.
2.1.16. Failures in FPD.
2.1.17. Dental Material aspects related to FPD.

2.2. OCCLUSION

2.2.1. Evaluation, Diagnosis and Treatment of Occlusal Problems
2.2.2. Scope, definition, terminology, optimum oral health, anatomic harmony, functional harmony, occlusal stability, causes of deterioration of dental and oral health, Anatomical, physiological, neuro-muscular, psychological, considerations of teeth, muscles of mastication, temporomandibular joint, intra oral and extra oral and facial musculatures, the functions of Craniomandibular system.
2.2.3. Occlusal therapy, the stomatognathic system, centric relation, vertical dimension, the neutral zone, the occlusal plane, differential diagnosis of temporomandibular disorders, understanding and diagnosing intra articular problems, relating treatment to diagnosis of internal derangements of TMJ, Occlusal splints, Selecting instruments for occlusal diagnosis and treatment, mounting casts, Pankey-mann-schuyler philosophy of complete occlusal rehabilitation, long centric, anterior guidance, restoring lower anterior teeth, restoring upper anterior teeth,determining the type of posterior occlusal contours, methods for determining the plane of occlusion, restoring lower posterior teeth, restoring upper posterior teeth, functionally generated path techniques for recording border movements intra orally, occlusal equilibration, Bruxism, Procedural steps in restoring occlusions, requirements for occlusal stability, solving occlusal problems through programmed treatment planning, splinting, solving - occlusal wear problems, deep overbite problems, anterior overjet problems, anterior open bite problems. Treating - end to end occlusion, splayed anterior teeth, cross bite patient, Crowded, irregular, or interlocking anterior bite, using Cephalometrics for occlusal analysis, solving severe arch malrelationship problems, transcranial radiography, postoperative care of occlusal therapy.

2.3. TMJ

2.3.1. Temporomandibular joint and its function, Temporomandibular joint dysfunction - Scope, definitions, and terminology Orofacial pain, and pain from the temporomandibular joint region temporomandibular joint dysfunction, temporomandibular joint sounds, temporomandibular joint disorders
2.3.2. Anatomy related, trauma, disc displacement, Osteoarthrosis/Osteoarthritis, Hyper mobility and dislocation, infectious arthritis, inflammatory diseases, Eagle's syndrome (Styloid - stylohyoid syndrome), Synovial chondromatosis, Osteochondrrosis disease, Ostonecrosis, Nerve entrapment process, Growth changes, Tumors, Radiographic imaging
2.3.3. Etiology, diagnosis and cranio mandibular pain, differential diagnosis and management, orofacial pain - pain from teeth, pulp, dentin, muscle pain, TMJ pain -psychologic, physiologic – endogenous control, acupuncture analgesia, Placebo effects on analgesia, Trigeminal neuralgia, Temporal arteritis
2.3.4. Occlusal splint therapy - construction and fitting of occlusal splints, management of occlusal splints, therapeutic effects of occlusal splints, occlusal splints and general muscles performance, TMJ joint uploading and anterior repositioning appliances, use and care of occlusal splints.
2.3.5. Occlusal adjustment procedures - Reversible - occlusal stabilization splints and physical therapies, jaw exercises, jaw manipulation and other physiotherapy or irreversible therapy - occlusal repositioning appliances, orthodontic treatment, Orthognathic surgery, fixed and emovable prosthodontic treatment and occlusal adjustment, removable

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prosthodontic treatment and occlusal adjustment, Indication for occlusal adjustment, special nature of orofacial pain, Indication for occlusal adjustment, special nature of orofacial pain, Psychopathological considerations, occlusal adjustment philosophies, mandibular position, excursive guidance, occlusal contact scheme, goals of occlusal adjustment, significance of a slide in centric, Preclinical procedures, clinical procedures for occlusal adjustment.

2.4. AESTHETICS

2.4.1. Scope, definitions, Morpho psychology and esthetics, structural esthetic rules - facial components, dental components, gingival components physical components.

2.4.2. Esthetics and its relationship to function - Crown morphology, physiology of occlusion, mastication, occlusal loading and clinical aspect in bio esthetic aspects.

2.4.3. Physical and physiologic characteristic and muscular activities of facial muscle, perioral anatomy and muscle retaining exercises

2.4.4.Smile - classification and smile components, smile design, esthetic restoration of smile.

2.4.5. Esthetic management of the dentogingival unit, intraoral plastic surgery for management of gingival contours, and ridge contours, Periodontal esthetics,

2.4.6. Restorations - Tooth colored restorative materials, the clinical and laboratory aspects, marginal fit anatomy, inclinations, form, size, shape, color, embrasures, contact point.

3. <u>PAPER – IV – ESSAY</u>

A 3 hour essay on any of the major topics in Prosthodontics.

PROSTHODONTIC TREATMENT MODALITIES

1. Tooth and tooth surface restorations
   Veneers - composites and ceramics
   Inlays- composite, ceramic and alloys
   Onlay - composite, ceramic and alloys
   Partial crowns - ¾th, 7/8th, proximal ½ crowns
   Pin-ledge restorations.
   Radicular crowns
   Full crowns
2. Tooth Replacements - PARTIAL /COMPLETE
   Tooth supported Fixed partial denture, Overdenture
   Tissue Supported Interim partial denture, Complete denture,
   Immediate denture
   Tooth and tissue supported Cast partial denture, Overdenture
   Precision attachment
   Implant supported Cement retained, Bar & clip attachment
   Screw retained Ball attachment
   Tooth and implant supported, Screw retained
   Cement retained
   Root supported, Dowel and core, Overdenture, Pin retained

3. Tooth and tissue defects (Maxillo- facial and Cranio-facial prostheses)
   Cleft lip and palate
   Partial and complete anodontia related to various syndromes
   Splints and stents as adjuncts to surgical procedures
   Prostheses for facial defects
   Auricular, nasal, ocular, orbital prostheses

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Craniofacial implants
Prostheses following hemi mandibulectomy and maxillectomy
Speech and velopharyngeal prostheses ▫ Laryngectomy aids, prosthetic nasal stents, burn stents, auditory inserts. Trismus appliance- screw gag

4. T.M.J and Occlusal disturbances
   Occlusal equilibration
   Splints - Diagnostic Repositioners / Deprogrammers
   Anterior bite plane
   Posterior bite plane
   Bite raising appliances
   Occlusal rehabilitation
5. Esthetic/Smile designing
   Laminates / Veneers
   Tooth contouring (peg laterals, malformed teeth)
   Tooth replacements
   Inter disciplinary management
6. Geriatric Prosthodontics
   Prosthodontics for the elderly
   Behavioral and psychological counseling
   Removable Prosthodontics
   Fixed Prosthodontics
   Implant supported Prosthodontics
   Maxillofacial Prosthodontics
   Psychological and physiological considerations
7. Preventive measures
   Modulation of diet and nutrition; counseling

PRECLINICAL EXCERCISES

- **Complete Denture**

1. Special tray with spacer in auto polymerizing resin
   i. Maxillary
   ii. Mandibular
2. Occlusal rims on maxillary and mandibular permanent bases
3. Teeth arrangement
   i. Class I
   ii. Class II
   iii. Class III with posterior cross bite
   iv. Balanced arrangement of teeth (Class I)
4. Acrylized balanced complete denture (Class I)

- **Removable Partial Denture**

1. Surveying, designing and wax pattern on mandibular and maxillary casts
   i. Kennedy Class I

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ii. Kennedy Class II

iii. Kennedy Class III

iv. Kennedy Class IV

2. Complete laboratory steps in the fabrication of anyone class of partial denture

- **Fixed Partial Denture**

Preparation of natural teeth mounted on a phantom head

1. Full crown
   i. Anterior
   ii. Posterior
2. Partial Veneer Crown
   i. ¾th crown on Canine
   ii. ¾th crown on Premolar
   iii. Proximal half-crown on mandibular second molar
   iv. 7/8th crown maxillary first molar

3. Preparation for

   porcelain laminate

   veneer Maxillary

   central incisor

- **Implant dentures**

1. Preparation of impression tray
   i. Open impression
   ii. Closed impression
2. Surgical guide for implant placement
3. Fabrication of radiographic template

STRUCTURED TRAINING PROGRAMME MDS FIRST YEAR

1. Preclinical works and lab exercises to be completed within 6 months
2. Seminars – 5 Nos (Applied basic sciences)
3. Library Dissertation to be completed in first year
4. Dissertation topic & submission of protocol of proposed dissertation work after obtaining ethical clearance –within 9 months
5. Journal review-6 no's
6. Attending conferences and Continuing Educational programmes Minimum 2 CDEs, 2 Conferences (one National)
7. Complete Dentures cases-20, Temporary RPD cases-20, maxillofacial prostheses-5

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8. Publication of scientific articles –minimum one
9. Clinical training
    9.1. Maintenance of a log book of recorded cases
10. Lecture classes for undergraduates – A minimum of 5 Lecturer classes should be taken for Undergraduate in presence of teaching faculty
11. Basic computer application- MS Office, Photo editing
12. Completion of seminar Vol.1

MDS SECOND YEAR

1. Journal review – 6Nos.
2. Seminar - 5 Nos (CD and RPD)
3. Clinical works
    3.1. Conventional CD-30
    3.2. Balanced CD -7
    3.3. Temporary RPD-30
    3.4. Crown /FPD-25
    3.5. MFP-15
    3.6. Cast RPD-5
    3.7. Case discussion – 10nos
4. Presenting Scientific papers/posters during state and national conferences -2 (one national)
5. Attending CDE-3
6. Publication of scientific articles-1
7. Lecturers for undergraduate students –A minimum of 5 Lecturer classes should be taken for Undergraduates in presence of teaching faculty.
8. Maintenance of Log book of recorded cases

MDS THIRD YEAR

1. Clinical Requirements in the 3rd year
    1.1. Conventional CD-10
    1.2. Temporary RPD-10
    1.3. Balanced CD- 5
    1.4. FPD cases-20
    1.5. MFP cases-10
    1.6. Cast RPD-5
    1.7. Implants-10 cases, out of which 2 implant supported overdentures
    1.8. Full mouth occlusal rehabilitation-2

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2. Journal review-5
3. Publication of Scientific articles – 3nos
4. CDE – 3nos
5. Seminars – 5 Nos (FPD and Oral Implantology)
6. Presentation of scientific papers in National and State level conferences –1+2
7. Case discussions – 10nos
8. Submission of Photo album on clinical cases- A minimum of 20 different types of cases
9. Submission of seminars vol. 1, 2 &3
10. Lecture classes for Undergraduates - A minimum of 5 Lecturer classes should be taken for Undergraduates in presence of teaching faculty.
11. At the end of 30th month of commencement of course, dissertation should be submitted

MDS CLINICAL TRAINING

Developing essential skills

*** Key**

O -Observes a procedure performed by a faculty A-Assists a senior faculty

PA- performs procedure under the direct supervision of a senior specialist

PI-Performs independently

PROCEDURE	**CATEGORY**			
	0	A	PA	PI
Tooth surface restorations				
Composites - fillings, laminates, inlay,	2	2	2	8
onlay Ceramics - laminates, inlays, onlays	1	1	1	8
CROWNS				
FVC in metal	1	2	2	10
FVC in all ceramic	1	2	2	10
FVC in full Metal	1	2	2	2
ceramic All ceramic-	1	1	1	2
3/4th crowns molar	1	-	-	5
7/8th crown on maxillary molar	1	-	-	5
Proximal half crown	1	-	-	5

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Pinledge and pinhole crowns	1	-	-	5
Telescopic crowns	1	-	-	5
Intraradicular crowns (central, lateral, canine, premolar, and molar)	1	-	-	5
Crown on implant supported prosthesis -		1	1	5

FIXED PARTIAL DENTURES

PROCEDURE	**CATEGORY**			
	0	A	PA	PI
Cast metal-precious and non precious(3 unit posterior)	1	-	-	5
Metal ceramic (anterior and posterior)	1	1	1	10
Multiple abutment- maxillary and mandibular full arch	1	1	1	5
Incorporation of custom made and readymade precision joint or attachment	1	1	1	5
Adhesive bridge for anterior/ posterior	1	-	1	10
Metal with acrylic resin facing anterior FPD	-	-	1	5
Immediate fixed partial dentures (interim)	1	-	-	5
Fixed prosthesis as a retention and rehabilitation	1	1	-	5
for acquired and congenital defects - maxillofacial	-	-	-	-
Prosthetics	-	-	-	-
Implant supported prosthesis	1	-	1	1
Implant - tooth supported prosthesis	1	-	1	1

REMOVABLE PARTIAL DENTURE

Provisional partial dentures	1	1	1	50
Cast removable partial denture	1	1	1	6
Removable denture with precision attachments and telescopic crowns for anterior and posterior	1	1	2	4
Partial denture for the medically compromised and handicapped	1	1	1	5

COMPLETE DENTURES -

Neutrocentric occlusion & characterized prosthesis	-	-	1	5
Complete dentures (by using semi adjustable articulator)	-	-	1	15
Single dentures	-	-	1	5

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Overlay dentures	-	-	1	5
Treatment complete dentures for abused tissues	-	-	1	5
Complete denture prosthesis (for abnormal ridge relation, ridge form and ridge size)	-	-	1	5
Complete dentures for patients with TMJ syndromes	-	-	1	5
Complete dentures for medically compromised and handicapped patients	-	-	1	5

GERIATRIC PATIENTS

Tooth and tooth surface restorations, crowns, fixed prosthesis, removable prosthesis	-	-	1	10

IMPLANT SUPPORTED COMPLETE PROSTHESIS -

Implant supported complete prosthesis (maxillary and Mandibular)	-	-	1	1

MAXILLOFACIAL PROSTHESES

Guiding flange and obturators	-	-	1	4
Speech and palatal lift prosthesis	-	-	1	2
Eye prosthesis	-	-	1	2
Ear prosthesis	-	-	1	2
Nose prosthesis	-	-	1	2
Face prosthesis	-	-	'-	1
Maxillary obturators	-	-	1	2
Hemimandibulectomy	-	-	1	2
Cranial prostheses	-	-	1	1
Finger/ hand, foot	-	-	1	2
Management of burns, scars	-	-	-	1

TMJ SYNDROME MANAGEMENT

Splints - periodontal, teeth, jaws	-	-	1	4
TMJ supportive and treatment prosthesis	-	-	1	1
Stabilization appliances for maxilla and mandible with freedom to move from IP to CRCP	-	-	-	1
In IP without the freedom to move to CRCP	-	-	-	1
Repositioning appliances, anterior disclusion	-	-	-	1

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Chrome cobalt and acrylic resin stabilization appliances	2	-	-	-

FULL MOUTH REHABILITATION

Full mouth rehabilitation - restoration of esthetics and function of stomatognathic system	-	1	-	4

INTER-DISCIPLINARY TREATMENT MODALITIES

Inter-disciplinary management - restoration of Oro craniofacial defects for esthetics, phonation, mastication and psychological comforts	-	1	-	2

MANAGEMENT OF FAILED RESTORATION

Tooth and tooth surface restorations	-	-	-	5
Removable prosthesis	-	-	-	10
Crowns and fixed prosthesis	-	5	-	-
Maxillofacial prosthesis	-	-	-	2
Implant supported prosthesis	-	-	-	1
Occlusal rehabilitation and TMJ syndrome	-	-	-	2
Restoration failure of psychogenic origin	-	-	-	5
Restoration failure to age changes	-	-	-	2

SCHEME OF EXAMINATION

MDS UNIVERSITY EXAMINATIONS

Theory

Consists of four papers each carrying 75 marks and 3 hour duration which would be centrally evaluated.

Practical / Clinical Examination

The examination shall be conducted in 3 days. If there are more than 6 candidates, it shall be extended for one more day. Each candidate shall be examined for a minimum of three days, six hours per day including viva voce. There must be four examiners out of which 50 percent of the examiners will be from other states.

The practical examination will include Complete Denture, Removable Partial Denture and Fixed Partial Denture.

DAY 1

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Discussion on Diagnosis and Treatment Planning, Evaluation of preliminary and final impressions. (CD)

– 1 hour

Orientation Jaw relation – 1 hour

Transferring the relation to

articulator – 1 hour Tentative Jaw

relation – 30 Minutes

Discussion on Diagnosis and Treatment planning (FPD)

- 30 Minutes Preparation of abutments – 1 hour 30

minutes

Isolation, Gingival retraction & Impression – 30 minutes

DAY 2

Evaluation of provisional restoration – 45 minutes

Evaluation of die preparation and wax pattern – 30 minutes

Pedagogy (8 minutes of presentation + 2 minutes of discussion/ candidate) 45 minutes

Thesis presentation (8 minutes of Presentation + 2 minutes of discussion/candidate)–1 hour

Presentation of special cases (15 Minutes / candidate, maximum of 4 cases)- 1-hour

Gothic arch tracing, Inter-occlusal records & Programming of articulator –2 hours.

DAY 3

Try in of CD – 1 hour

Surveying of cast and designing of RPD – 1 hour

Discussion on components & selection of materials – 1

hour 30 minutes Viva voce – 2 hours 30 minutes

EVALUATION OF PRACTICALS & VIVA- VOCE

Practical /Clinical Examination: 200 Marks

1. **Presentation of treated patients and records during their three year training period.**

25 Marks

1.1 Evaluation of pre- clinical exercises and academic records during MDS course

10 marks

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1.2 Presentation of treated special cases 15 marks

2. Clinical procedures-complete denture 100Marks

2.1 Discussion on treatment plan, evaluation of Preliminary impression, & Final Impression 15marks

2.2 Orientation Jaw Relation 5marks

2.3. Tentative jaw relation records 10 marks

2.4 Transferring it on articulators 5 marks

2.5 Extra oral tracing and securing centric and protrusive/lateral. 25marks

2.6 Programming the articulator 5 marks

2.7 Selection of teeth 5 marks

2.8 Arrangement of teeth 15marks

2.9 Waxed up denture try-in 10marks

2.10 Evaluation of previously processed denture. 5marks

All steps will include chair side and lab viva voce

3. Fixed Partial Denture 50Marks

3.1 Discussion on Diagnosis and treatment planning 5marks

3.2 Abutment preparation, isolation and fluid control 25marks

3. 3 Gingival retraction and impressions 10marks

3.4. Cementation of provisional restoration 10marks

4. Removable Partial Denture 25Marks

4.1 Surveying and designing of partially edentulous cast 10marks

4.2 Discussion on components and material selection 15marks

Viva Voce 100Marks

i. Viva-Voce examination: 80marks

All examiners will conduct viva-voce conjointly on candidate's comprehension, analytical approach, expression, interpretation of data and communication skills. It includes all components of course contents. It includes presentation and discussion on dissertation also.

ii. Pedagogy Exercise: 20marks

Pedagogy and thesis presentation (10 +10)20 marks

A topic will be given at the beginning of the clinical examination and will have to be presented for 8-10 minutes.

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2.7 Total number of hours

As per the regulations of the DCI

2.8 Branches if any with definition

Prosthodontics and Crown & Bridge

2.9 Teaching learning methods

Method of Training

The training of a postgraduate student shall be full time but graded responsibilities in the management and treatment of patients entrusted to his/her care. The participation of the students in all facets of educational process is essential. Every candidate should take part in seminars, group discussions, case demonstrations, clinics, journal review meetings, and clinical meetings. Every candidate shall be required to participate in the teaching and training programme of undergraduate students and interns. Training should include involvement in laboratory and experimental work, and research studies.

Every Institution Undertaking Post Graduate training programme shall set up an Academic cell or a Curriculum Committee, under the chairmanship of a Senior faculty member, which shall work out the details of the training programme in each speciality in consultation with other Department faculty staff and also coordinate and monitor the implementation of these training Programs.

Based on the above guidelines for a structured training programme for postgraduate courses, the basic tenets of a successful postgraduate teaching programme, are detailed under the following heads.

- **Formal Lectures** by the faculty on varied subjects including general areas and systems. Both senior and junior faculty can do this. However, the number of these classes should be maintained of low levels to encourage self-learning.
- **Symposia / Seminars** form an integral part of PG learning. A monthly symposium will generate approximate 30-35 symposia / course. These symposia can include department faculty and HODs as chairpersons and maximum involvement of both students and faculty should be ensured.
- **Clinical Discussions** form the core of PG training and can be assigned to various clinical units on rotating basis. However other faculty could also actively participate inthe discussion. The discussions must be 3-4/week. One suggestion is to score the performance of the candidate by a small panel of faculty and convey the scores to the candidate / PG at the end of the session.
- **Journal Club /Clinical Club** should be conducted at least once in a week in each postgraduate department. Journal clubs not only imparts new information but also trains the candidate to objectively assess and criticize various articles which come out and should be useful in ensuring evidence based dentistry.
- **Guest Lectures** can be integrated into the PG program at least once in a month. Even the retired faculty can be invited for delivering the lectures

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and will ensure importing of greater wisdom to the candidates.

- **Orientation Classes** for newcomers should also be incorporated. These classes can even be assigned to junior faculty/senior PG.
- **Clinical posting.** Each PG student should work in the clinics on regular basis to acquire adequate professional skills and competency in managing various cases to be treated by a specialist.
- **Clinico Pathological Conferences** should be held once a year involving the faculties of Oral Medicine and Radiology, Oral Pathology and concerned clinical department. The student should be encouraged to present the clinical details, radiological and histo- pathological interpretations and participation in the discussions.
- **Rotation postings in other departments** should be worked out by each department in order to bring in more integration between the speciality and allied fields.
- **Periodical Quiz** can be both informative and entertaining and should be encouraged and planned.
- **Computer Training and Internet Applications** are now becoming a must for both faculty and students. These areas should be strengthened as a next step. There can be a sort of internet information club in the departments.
- **Conferences/CDEs** – All postgraduate students should be encouraged to attend conferences and CDEs. They should also be asked to present papers wherever appropriate and should be rewarded by assigning scores for them.
- **Publication of scientific papers** – It is desirable and advisable to have at least two publications in the State/National/International indexed dental journals.
- **Involvement in Teaching Activity** – PG students can be assigned the job of teaching the undergraduate students and these will definitely improve the teaching skills in the post graduate students.

Examinations

Evaluation is a continuous process, which is based upon criteria developed by the concerned authorities with certain objectives to assess the performance of the learner. This also indirectly helps in the measurement of effectiveness and quality of the concerned MDS programme. Evaluation is achieved by two processes

1) Formative or internal assessment

2) Summative or university examinations.

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Formative evaluation is done through a series of tests and examinations conducted periodically by the institution. Summative evaluation is done by the university through examination conducted at the end of the specified course.

A candidate registered for MDS course must clear the final examination within six years of the date of admission. The examinations should be so organized that this shall be used as the mechanism to confirm that the candidate has acquired appropriate knowledge, skill and competence at the end of the training that he/she can act as a specialist and/or a medical teacher as per expectation. University examination will be held regularly by KUHS in April-May/October-November every year.

A candidate who wishes to study for MDS in a second specialty should have to take the full course of 3 years in that specialty and appear for the examinations.

2.10 Content of each subject in each year

Present in clause 2.6

2.11 No: of hours per subject

Present in clause 2.6

2.12 Practical training

Present in clause 2.6

2.13 Records

Present in clause 2.20

2.14 Dissertation: As per Dissertation Regulations of KUHS

Every candidate pursuing MDS degree course is required to carry out work on a selected research project under the guidance of a recognized postgraduate teacher. The results of such a work shall be submitted in the form of a dissertation.

The dissertation is aimed to train a postgraduate student in research methods and techniques. It includes identification of a problem, formulation of a hypothesis, search and review of literature, getting acquainted with recent advances, designing of a research study, collection of data, critical analysis, and comparison of results and drawing conclusions. Every candidate shall submit to the University in the prescribed format a synopsis containing particulars of proposed dissertation work after obtaining ethical clearance from the Institutional Ethical Committee **within six months from the date of commencement of the course or before the dates notified by the University**. The synopsis shall be sent only through the Principal of the institution.

Such synopsis will be reviewed and the dissertation topic will be registered

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by the university. No change in the dissertation topic or guide/co-guide shall be made without prior approval of the University. The dissertation should not be just a repetition of a previously undertaken study but it should try to explore some new aspects. The dissertation should be written under the following headings:

Introduction

i. Aims and Objectives of the study
ii. Review of Literature
iii. Methodology
iv. Results
v. Discussion
vi. Conclusion
vii. Summary
viii. References
ix. Annexures

The written text of dissertation shall be not less than 50 pages and shall not exceed 150 pages excluding references, tables, questionnaires, and other annexures. It should be neatly typed (font size 13-Times New Roman or font size 13-Cambria) in 1.5 line spacing on one side of the paper (A4 size, 8.27" x 11.69") and bound properly. Spiral binding should be avoided. (Refer KUHS website). The guide, co-guide if any, Head of the Department and the Head of the Institution shall certify the dissertation. For uniformity, it was suggested that the colour of the hard bind of the dissertation for all branches of MDS course in the purview of KUHS shall be dark brown with letters of gold colour. The title, author, and year of study should also be imprinted or embossed on the spine of the book. **Three hard copies and one properly labeled soft copy in a CD (refer KUHS website) of the dissertation thus prepared shall be submitted to KUHS on the 29th month of commencement of the course / 31st Oct. of the 3rd academic year, whichever falls first.** Dissertation should preferably be sent to a minimum of three reviewers / examiners /assessors, of which two shall be from out side the state and one from the affiliated colleges o KUHS. If modifications are to be made as specified, three hard copies and one soft copy of the dissertation after corrections made by the candidiate should be submitted with in a minimum of 30 days to the University. Consent for acceptance for evaluation of dissertation should be obtained from the reviewer/examiner/ assessor before the dissertation are despatched. Proforma for evaluation of dissertation should be sent along with the copies of the dissertation to the reviewers appointed by the university. The Proforma should contain all the assessment criteria with the clause – **Accepted/Accepted with modifications/ Rejected** and reasons for rejection by the examiner. This proforma should be sent back to the University within two weeks / within the date specified after receipt of dissertation. The dissertation may be declared accepted if more than 50% of the reviewers (2 in the case of 3 reviewers) have accepted it.If modifications are to be made as specified, 3 hard copies and one soft copy of the dissertation after corrections made by the candidate should be submitted within 30 days to the University which may be

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sent back to the same examiner/s by the University for Acceptance after a fee has been levied from the candidate. If the dissertation has been rejected by more than 50% of the reviewers (2 in the case of 3 reviewers), the dissertation may be reviewed by an Expert Reviewing Committee comprising of not less than two subject experts, Dean (Research) of KUHS and Guide of the candidate provided the Guide requests for a review, after a fee has been levied from the candidate. If rejected by the Reviewing Committee, the candidate should take up a new topic and undergo all the procedures of submitting the synopsis, fees, IEC clearance, etc as prescribed by the University. The candidate who takes up the new topic can appear only for the subsequent examination.

Approval of dissertation work is an essential precondition for a candidate to appear in the University examination. Hall tickets for the university examination should be issued to the candidate only if the dissertation has been accepted.

A candidate whose dissertation has been accepted by the examiners and approved by the University, but who is declared to have failed at the final examination will be permitted to reappear at the subsequent MDS examination without having to prepare a dissertation.

Guide – The academic qualification and teaching experience required for recognition by the University as a guide for dissertation work is as laid down by the Dental Council of India / KUHS.

Co-guide – A co-guide may be included provided the work requires substantial contribution from the same department or a sister department or from another institution recognized for teaching/training by KUHS/DCI. The co-guide should fulfill the academic qualification and teaching experience required for recognition by the University as a co-guide for dissertation work.

Change of Guide – In the event of a registered guide leaving the college for any reason or in the event of death of guide, guide may be changed with prior permission from the University.

2.15 Speciality training if any

Present in clause 2.6

2.16 Project work to be done if any

Present in clause 2.6

2.17 Any other requirements [CME, Paper Publishing etc.]

Present in clause 2.6

2.18 Prescribed/recommended textbooks for each subject <u>Applied Basic Sciences</u>

SUBJECT	NAME OF AUTHOR	NAME OF BOOK
Anatomy	BD Chaurasia	BD Chaurasia's Human Anatomy
	William, Peter L	Grays Anatomy

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Oral Anatomy	Ash, Major M	Wheelers Dental Anatomy, Physiology and Occlosion
	Sicher, Harry, Du Brull , Llyod	Oral Anatomy
Oral Histology	Bhaskar B.N. Ed	Orbans Oral Histology and Embryology
	Avery, James K	Essentials of Oral Histology and Embryology
Embryology	Sadler	Langmans Medical Embryology
	Inderbeer Singh	Human Embryology
Physiology	Guyton Arthur and John L Hall	Text Book of Medical Physiology
	Ganong, William F	Review of Medical Pysiology
Pharmacology	KD Tripathi	Essentials of Medical Pharmachology
	Hardman, Joel G	Goodman and Gillmans pharmacological basis of
Nutrition	Nizel	Nutrition in Preventive Dentistry: Science and Practice
General Pathology	Cotran, Ramzi S and Others	Robbins Pathologic Basis of Disease
	Harsh Mohan	Textbook of Pathology
Oral Pathology	Shaffer, William and Others	Textbook of Oral Pathology
	Neville, Brad W and Others	Oral and Maxillofacial Pathology
Microbiology	Ananthanarayan and Panicker	Textbook of Microbiology
	Lakshman S	Essential Microbiology for Dentistry
Biostatistics	Dr. Symalan	Statistics in Medicine
	Soben Peter	Essentials of Preventive and Community Dentistry
	Sunder Rao and Richard J.	Introduction to Biostatistics and Research Methods

Dental Materials

1. Dental Materials- Properties and manipulation-O'Brien
2. Restorative Dental Materials- Robert G.Craig
3. Notes on Dental Materials- ECCombe
4. Applied Dental Materials-McCabe
5. Philip's science of Dental Materials-Anusavice
6. Esthetics, Composite bonding technique and Materials-Jorden

COMPLETE DENTURE

1. Prosthodontic treatment for edentulous patients: Complete dentures and implant supported prostheses- Zarb George A. Ed and CharlesL.Bolender
2. Essentials of complete denture Prosthodontics- Sheldon Winkler
3. Text book of Complete dentures- Arther O Rahn and Charles M.Heartwell
4. Swensons Complete dentures-Swenson, MerillG.
5. Denture prosthetics: Complete dentures- Nagle and sears

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6. Complete dentures Prosthodontics- John J Sharry
7. Treatment of edentulous patient- VictorO.Lucia
8. Clinical Dental prosthetics- Fenn and Lidelow
9. Dental lab procedures- Complete dentures – Morrow, Robert M and others
10. Complete denture- A clinical pathway-McEntee
11. Problems and solutions in complete denture Prosthodontics- Lamb, DavidJ
12. A color atlas of Complete denture- John WHobkirk
13. Color atlas and text of Complete Denture-Grant
14. Clinical dental Prosthodontics- PennNRW
15. Mastering the art of Complete denture- G Raser and R.Godd
16. Geriatric dentistry- Aging and oral health
17. Synopsis of Complete dentures- Charles W.Bartlett
18. Clinical problem solving in Prosthodontics- David W.Bartlett
19. Treatment of edentulous patients – J. Fraser, McCord

REMOVABLE PARTIAL DENTURE

1. Removable partial denture- Grasso and Miller
2. Mc. Crackens removable partial Prosthodontics- McGivney, Glen P, Castleberry, DwightJ
3. Clinical Removable Partial Prosthodontics-Stewart
4. Removable Denture Prosthodontics- Alan AGrant
5. Partial dentures- Terkla, Louis G, Laney, WilliamR
6. Partial denture prosthetics – Neill D J and Walt JD
7. Partial dentures-Osborne
8. Atlas of Removable partial denture design- Stratton, Russel J, Wiebelt, FrankJ
9. Dental lab procedures- Removable partial dentures- Rudd, Kenneth D and others
10. Removable denture construction- Butes, John P. and others
11. A color atlas of removable partial dentures – JD Davenport
12. Removable denture Prosthodontics-Lechner
13. Removable Partial denture-Revenue/Bochu
14. Removable Partial Prosthodontics: A case oriented manual of treatment planning-Lechner S. and Mac Gregor

FIXED PARTIAL DENTURE

1. Contemporary Fixed Prosthodontics- Rosensteil, StephenF.
2. Fundamentals of Fixed Prosthodontics- Herbert T,Shillingburg
3. Theory and practice of crown and bridge Prosthodontics- Tylman, StanleyD
4. Occlusion- Ash and Ramjford
5. Evaluation, diagnosis and treatment of occlusal problems-Dawson
6. Management of TMJ disorders and occlusion-Okesson
7. Planning and making crown and bridge- Bernad C NSmith
8. Esthetics of Anterior Fixed Prosthodontics-Chiche/Pinnualt
9. Change your smile-Goldstein
10. Text book of Occlusion- Mohl/ Zarb/Rough
11. Ceramometal Fixed partial denture-Iracron
12. Precision fixed Prosthodontics- Clinial and laboratory aspects-Shconanbayer
13. Dental Ceramics- McLean
14. Science and Art of Dental Ceramics- Vo. I , Vol. II- McLean
15. Dental Lab procedures- Fixed partial dentures – Rhoads, John E and others

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16. Introduction to Metal Ceramic Technology- Naylor, PatricW
17. Esthetic restoration: Improved dentist laboratory communication- Muia, Paul J and Petersburg
18. Esthetic approach to metal ceramic restoration for the mandibular anterior region- Muterthies,Klaus
19. Precision fixed Prosthodontics: Clinical and laboratory aspects- MartignoniM.
20. Aesthetic design for ceramic restoration- Korson,David
21. Modern practice in crown and bridge Prosthodontics- Johnston and Dykema
22. Modern Gnathological concept – updated- Victor O.Lucia
23. Complete mouth rehabilitation through crown and bridge Prosthodontics- Kazis H. and KazisJ
24. Occlusion and clinical practice- An evidence based approach-Klineberg and Jagger

MAXILLOFACIAL PROSTHETICS

1. Prosthetic rehabilitation- Keith F.Thomas
2. Clinical Maxillofacial prosthesis-Taylor
3. Maxillofacial Prosthodontics-Chalian
4. Maxillofacial rehabilitation- John J.Beumer

IMPLANT PROSTHODONTICS

1. Contemporary Implant Dentistry - Carl E.Misch
2. Principles and practice of oral implantology-Weiss
3. Practical implant dentistry- Arun KGarg
4. Implant Prosthodontics clinical and laboratory procedures-Stevens
5. Atlas of oral implantology- NormanCranin
6. Endosteal dental implants-McKinney
7. Implant Prosthodontics- Surgical and prosthetic procedures-Fagan
8. Implant Prosthodontics- clinical and laboratory procedures-Fagan
9. Osseo integration and occlusal rehabilitation- Hobo, Sumiya and others
10. Oral rehabilitation with implant supported prostheses- Jimenez lopez,Vicente
11. Branemarkosseo integrated implant- Albrektsson and George AZarb
12. Clinical atlas of dental implant surgery- Michael S.block
13. Dental implants- The art and science – Charles ABabbush
14. Guided bone regeneration in implant dentistry- Buser, Daniel and others
15. Tissue- integrated prostheses: Osseo integration in clinical dentistry- Per-Ingvar Branemark and others

2.19 Reference books

As suggested by HOD

2.20 Journals

1. Journal of Prosthetic Dentistry.
2. British Dental Journal
3. International Journal of Prosthodontics
4. Journal of Prosthodontics
5. Journal of American Dental Association

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6. Dental Clinics of North America
7. Quintessence international
8. Australian Dental Journal
9. Journal of Indian Dental Association
10. Journal of Oral Implantology

2.21 Logbook

- **Work Diary / Log Book**

Logbooks serve as a document of the trainee's work. The trainee shall maintain this Logbook of the special procedures/operations observed/assisted/performed by him/her during the training period right from the point of entry and its authenticity shall be assessed weekly by the concerned Post Graduate Teacher / Head of the Department. This shall be made available to the Board of Examiners for their perusal at the time of his / her appearing at the Final examination. The logbook should record clinical cases seen and presented, procedures and tests performed, seminars, journal club and other presentations. Logbook entries must be qualitative and not merely quantitative, focusing on learning points and recent advances in the area and must include short review of recent literature relevant to the entry. A work diary containing all the various treatment done by the candidate in the course of the study should also be maintained. The work diary shall be scrutinized and certified by both the guide/co guide and Head of the Department and presented in the University practical/clinical examination.

3 EXAMINATIONS

3.1 Eligibility to appear for exams

Every candidate to become eligible to appear for the **MDS examination** shall fulfill the following requirements.

Attendance

Every candidate shall have fulfilled the attendance prescribed by the University during **each academic year** of the Postgraduate course. A candidate becomes eligible for writing the University examination only after the completion of 36 months from the date of commencement of the course The candidates should have completed the training period before the commencement of examination.

Dissertation

Approval of the dissertation is a mandatory requirement for a candidate to appear for the MDS University examination.

Library Dissertation

Submission of library dissertation as per the regulations of DCI / KUHS is

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mandatory for a candidate to appear for the university examination.

Progress and Conduct

Every candidate shall have participated in seminars, journal review meetings, symposia, conferences, case presentations, clinics and didactic lectures during each year as designed by the concerned department.

Work Diary and Logbook

Every candidate shall maintain a work diary and logbook for recording his/her participation in the training programmes conducted by the department. The work diary and logbook shall be verified and certified by the Head of the department.

The certification of satisfactory progress by the Head of the Department and Head of the Institution shall be based on check list given in 5.1 to 5.8.

- **Students should note that in case they do not complete the exercises and work allotted to them within the period prescribed, their course requirements will be considered unfulfilled.**
- **Clinical Records, Work Diaries and Logbooks should be maintained regularly and approved by the guide, duly certified by the Head of the Department.**

3.2 Schedule of Regular/Supplementary exams

The MDS examination shall be held at the end of the third academic year. The university shall conduct two examinations in a year at an interval of four to six months between two examinations. **Not more than two examinations shall be conducted in an academic year.**

3.3 Scheme of examination showing maximum marks and minimum marks

- MDS examination will consist of Written (Theory), Viva Voce, and Practical / Clinical examinations.

Written Examination (Theory): 300 Marks

Written examination shall consist of **four question papers**, each of three hours duration. Each paper shall carry 75 marks. The type of questions in the first three papers will be two long essay questions carrying 20 marks each and five short essay questions each carrying seven marks. **There will be no options in the questions in the first 3 papers. Fourth paper will be a single essay question paper which will carry an option and the candidate is to answer only one of the essays.** Questions on recent advances may be asked in any or all the papers. **The syllabus for the theory papers of the concerned specialty should cover the entire field of the subject. Though the topics assigned to the different papers are generally evaluated under designated papers, a strict division of the subject may not be possible and some overlapping of topics is inevitable. Students should be prepared to answer overlapping topics.** The theory examinations shall be held sufficiently earlier than the practical/clinical examinations so that the answer books can be assessed and evaluated before the start of the practical/clinical examination. The total marks for the theory examination shall be 300.

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Practical Examination: 200 Marks

In case of practical examination, it should aim at assessing competence and skills of techniques and procedures. It should also aim at testing student's ability to make relevant and valid observations, interpretation and inference of laboratory or experimental or clinical work relating to his/her subject for undertaking independent work as a specialist. The total mark for practical/clinical examinations shall be 200.

Viva voce: 100 Marks

Viva voce examination shall aim at assessing depth of knowledge, logical reasoning, confidence and oral communication skills. The candidate may be given a topic for the pedagogy in the beginning of the clinical examination and asked to make a presentation on the topic for 8-10 minutes. The total marks shall be 100 of which 80 would be for the viva voce (20 marks/examiner) and 20 marks for the pedagogy.

3.4 Papers in Written examination

Paper-I - Applied Anatomy, Physiology, Pathology and Dental Materials
Paper-II- Removable Prosthodontics and Oral Implantology
Paper-III- Fixed Prosthodontics
Paper-IV - Essay

3.5 Details of theory exams

Written examination shall consist of four papers each of three hours duration. Total marks for each paper will be 75. Paper I, II and III shall consist of two long questions carrying 20 marks each and 5 short essay questions carrying 7 marks each.

Distribution of topics for each paper will be as follows:

Paper I : Applied Basic Sciences: Applied Anatomy, embryology,growthand development,Genetics, Immunology, anthropology, Physiology, nutrition & Biochemistry, Pathology & Microbiology, virology, Applied pharmacology, Research Methodology and bio statistics,. Applied Dental anatomy & histology, Oral pathology & oral Microbiology, Adult and geriatric psychology. Applied dental materials.

PaperII: Complete denture & Removable Prosthodontics and Implant supported prosthesis (Implantology), Geriatric dentistry and Cranio facial Prosthodontics

PaperIII: Fixed Prosthodontics, occlusion, TMJ and esthetics.

PaperIV: Essay

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3.6 Model Question Paper

MDS Prosthodontics and Crown and Bridge

Paper I : Applied Anatomy, Physiology, Pathology and Dental Materials

(Answer all questions)

Time 3 hours Marks 75

Long essays **(2 x 20 = 40 marks)**

1. Describe the anatomy of the Temporomandibular joint. Discuss the movements possible at the joint, mentioning the muscles causing them.

   (10+10=20)

2. Classify leucocytes. Give an account of leucopoiesis. Mention normal counts of granulocytes and give their functions.

   (5+5+5+5=20)

Short essays **(5 x 7 = 35 marks)**

3. Non-steroidal anti-inflammatory drugs.

4.Chemical mediators of inflammation. 5.Radiation Hazards.

5.Research Ethics

6.Recent advances in Impression Materials

Paper II –Removable Prosthodontics and Oral Implantology

(Answer all questions)

Time:3hours Max marks: 75

Long essays

(2 x 20 = 40marks)

1. Classify implant supported overdentures. Describe the biomechanical aspects and treatment planning of such overdentures. (5+5+10=20)

   Mention the various jaw relations to be registered for making a complete denture. Mention the common difficulties encountered in registering the relations. What are the methods of overcoming such difficulties? (5+5+10=20)

Short essays **(7 x 5=35 marks)**

2. Different types of block out procedures in the fabrication of a removable partial denture
3. Principles of designing direct retainer for a removable partial denture
4. Prosthodontic management of a patient requiring maxillectomy

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5. Role of teeth arrangement in improving speech in complete denture wearers
6. Recent developments in dental cast surveyors.

Paper III –FIXED PARTIAL PROSTHODONTICS, OCCLUSION, TMJ AND AESTHETICS

(Answer all questions)

Time: 3 hrs Max marks : 75

Long essays **(2 x 20 = 40marks)**

1. Describe the various designs and indications of gingival margin preparations of teeth for a fixed partial denture. (10+10=20)
2. Classify splints and their role in the management of Temporomandibular disorders. (5+15=20)

Short essays **(7 x 5=35mark)**

3. Various designs of tooth preparation for porcelain laminate veneers.
4. Principles of pontic design
5. Importance of provisional prostheses in fixed Prosthodontics
6. Biological failures in tooth supported fixed partial dentures
7. Canine protected occlusion

Paper IV – ESSAY

Time:3hours Marks:100

(Answer any one of the following)

1. Splints used in prosthodontics.

OR

2. Prosthetic options in implant dentistry

3.7 Internal assessment component

Not applicable.

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3.8 Details of practical/clinical exams

The Practical / Clinical examination shall be conducted in 3 days. If there are more than 6 candidates, it shall be extended for one more day. Each candidate shall be examined for a minimum of three days, six hours per day including viva voce. There must be four examiners out of which 50 percent of the examiners will be from other states.

The practical examination will include Complete Denture, Removable Partial Denture and Fixed Partial Denture.

Day 1

Complete Denture (CD):

Discussion on diagnosis and treatment planning, Evaluation of Preliminary and Final impressions – 1hour

Orientation jaw relation - 1 hour

Transferring the relation to articulator – 1 hour

Tentative jaw relation – 30 minutes

FPD :

Discussion on diagnosis and treatment planning - 30 minutes

Preparation of abutments – 1hour 30 minutes

Isolation, Gingival retraction & impression – 30minutes

Day 2

FPD : Evaluation of provisional restoration –45minutes

Evaluation of die preparation and wax pattern – 30minutes

CD : Gothic arch tracing, Inter-occlusal records & Programming of articulator–2 hours

Pedagogy : (8 minutes of presentation and 2 minutes of discussion per candidate) – 45 minutes

Thesis presentation: (8 minutes of presentation plus 2 minutes of discussion per candidate) – 1 hour

Presentation of special cases (15 minutes per candidate, maximum of 4 cases) – 1 hour

Day 3

Try in of CD – 1 hour

Surveying of cast and designing of RPD – 1 hour

Discussion on components and selection of materials – 1 hour

30 minutes Viva voce – 2 hours 30 minutes

EVALUATION OF PRACTICALS

Practical /Clinical Examination: **200 Marks**

1.1 Evaluation of preclinical exercises and academic records during MDS course – 15 marks

1.2. Presentation of treated special cases –10 marks

Clinical procedures:

2. Complete Denture-100 Marks

2.1. Discussion on treatment planning, evaluation of Preliminary impression & Final impression–15marks

2.2. Orientation jaw relation -5 marks

2.3. Tentative Jaw relation records-10 marks

2.4. Transferring it on articulators – 5 marks

2.5. Extra oral tracing and obtaining intra oral records – 25 marks

2.6. Programming the articulator – 10 marks

2.7. Selection of teeth -5 marks

2.8. Arrangement of teeth – 15 marks

2.9. Try in –10 marks

3. Fixed Partial Denture : 50 marks

3.1. Discussion on diagnosis and treatment planning – 5 marks

3.2. Abutment preparation – 25 marks

3.3. Isolation, Gingival retraction & Impression – 10 marks

3.4. Evaluation of provisional restoration – 10 marks

4. Removable Partial Denture : 25marks

4.1 Surveying and designing of partially edentulous cast – 10 marks

4.2. Discussion on components and material selection –15 marks

3.9 Number of examiners needed (Internal & External) and their qualifications

There shall be at least four examiners in each branch of study. Out of four, two (50%) should be external examiners and two shall be internal examiners. The qualification and teaching experience for appointment as an examiner shall be as laid down by the DCI. The external examiners shall ordinarily be invited from another recognized University from outside the state. An external examiner may ordinarily be appointed for the same institute for not more than two years consecutively. Thereafter he may be reappointed after an interval of one year. The same set of examiners shall ordinarily be responsible for the practical and viva voce of the examination.

The Head of the Department shall ordinarily be one of the examiners and the chairperson of the Board of Examinations; second internal examiner shall rotate after every two consecutive examinations if there are more than two postgraduate teachers in the department other than the Head of the department. No person who is not an active Postgraduate teacher in that subject can be appointed as Examiner. However, in case of retired personnel,

a teacher who satisfies the above conditions could be appointed as examiner up to one year after retirement.

For the MDS examination, if there are no two qualified internal examiners in an institute the second internal examiner can be from a neighboring DCI and KUHS approved / recognized Dental College having PG course in the specific speciality. This examiner should be an active PG teacher in the same speciality with the qualifications and experience recommended for a teacher for postgraduate degree programme. The examination can also be conducted by one qualified internal examiner and three qualified external examiners if there is no qualified second internal examiner.

Reciprocal arrangement of Examiners should be discouraged, in that, the internal examiner in a subject should not accept external examinership of a college from which the external examiner is appointed in his subject in the same academic year.

3.10 Details of viva

Viva Voce :100 Marks

i. Viva-Voce examination :80marks

All examiners will conduct viva-voce conjointly on candidate's comprehension, analytical approach, expression, interpretation of data and communication skills. It includes all components of course contents. It includes presentation and discussion on dissertation also.

ii. Pedagogy and thesis presentation: 10 +10 = 20marks

4.INTERNSHIP

Not applicable for PG Courses

5.ANNEXURES

5 Check Lists for Monitoring: Log Book, Seminar Assessment etc.

CHECK LISTS and LOG BOOK

5.1: Checklist 1

Model Checklist for Evaluation of Preclinical Exercises

Name of Student: Date:

Name of the Faculty-in-charge:

Name of Exercise

Sl. No:	Items for observation during evaluation	Score
1	Quality of Exercise	
2	Ability to answer to questions	
3	Punctuality in submission of exercise	
4	TOTAL SCORE	

Performance	Score
Poor	0
Below Average	1
Average	2
Good	3
Very good	4

Signature of Faculty-in-charge

5.2: Checklist 2

Model Checklist for Evaluation of Journal Review / Seminar Presentation

Name of Student: Date:

Name of the Faculty/Observer:

Name of Journal / Seminar:

Sl. No:	Items for observation during evaluation	Score
1	Relevance of Topic	
2	Appropriate Cross references	
3	Completeness of Preparation	
4	Ability to respond to questions	
5	Effectiveness of Audio-visual aids used	
6	Time Scheduling	
7	Clarity of Presentation	
8	Overall performance	
9	TOTAL SCORE	

Performance	Score
Poor	0
Below Average	1
Average	2
Good	3
Very good	4

Signature of Faculty/Observer

5.3 :Checklist 3

Model Checklist for Evaluation of Clinical Case and Clinical Work

Performance	Score
Poor	0
Below Average	1
Average	2
Good	3
Very good	4

Sl. No:	Items for observation during evaluation	Score
1	History	
	Elicitation	
	Completeness	
2	Examination	
	General Examination	
	Extra oral examination	
	Intraoral examination	
3	Provisional Diagnosis	
4	Investigation	
	Complete and Relevant	
	Interpretation	
5	Diagnosis	
	Ability to defend diagnosis	
6	Differential Diagnosis	
	Ability to justify differential diagnosis	
7	Treatment Plan	
	Accuracy	
	Priority order	
8	Management	
9	Overall Observation	
	Chair side manners	
	Rapport with patient	
	Maintenance of Case Record	
	Quality of Clinical Work	
	Presentation of Completed Case	
10	TOTAL SCORE	

Name of the Faculty/Observer:

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5.4 : Checklist 4

Model Checklist for Evaluation of Library Dissertation Work

Name of Student: Date:

Name of the Faculty/Guide:

Performance	Score
Poor	0
Below Average	1
Average	2
Good	3
Very good	4

Sl. No:	Items for observation during evaluation	Score
1	Interest shown in selecting topic	
2	Relevance of Topic	
3	Preparation of Proforma	
4	Appropriate review	
5	Appropriate Cross references	
6	Periodic consultation with guide	
7	Completeness of Preparation	
8	Ability to respond to questions	
9	Quality of final output	
9	TOTAL SCORE	

Signature of Faculty/Guide

5.5 : Checklist 5

Model Checklist for Evaluation of Dissertation Work

Name of Student: Date:

Name of the Faculty/Guide/Co-guide:

Sl. No:	Items for observation during evaluation	Score	Performance	Score
1	Interest shown in selecting topic		Poor	0
2	Relevance of Topic		Below Average	1
3	Preparation of Proforma		Average	2
4	Appropriate review		Good	3
5	Appropriate Cross references		Very good	4
6	Periodic consultation with guide/co- guide			
7	Depth of Analysis / Discuss			
8	Ability to respond to questions			
9	Department Presentation of findings			
10	Quality of final output			
	TOTAL SCORE			

Signature of Faculty/Guide/Co-guide

5.6 :CHECKLIST-6

CONTINUOUS EVALUATION OF DISSERTATION WORK BY GUIDE/CO-GUIDE

Name of the Trainee: Date

Name of the Faculty/Observer:

Sl.No.	Items for observation during	Poor 0	Below Averag	Average 2	Good 3	Very Good 4
1.	Periodic consultation with guide / co- guide					
2.	Regular collection of case material					
3.	Depth of Analysis / Discussion					
4.	Department presentation of findings					
5.	Quality of final output					
6.	Others					
	Total score					

Signature of the guide / co-guide

5.7 ;CHECKLIST -7

OVERALL ASSESSMENT SHEET

Name of the College: Date:

Name of Department:

Check List No	PARTICULARS	Name of trainee		
		First Year	Second Year	Third Year
1	Preclinical Exercises			
2.	Journal Review /Presentation			
3.	Seminars			
4	Library dissertation			
5.	Clinical work			
6-	Clinical presentation			
7.	Teaching skill practice			
8.	Dissertation			
	TOTAL			

Signature of HOD **Signature of Principal**

The above overall assessment sheet used along with the logbook should form the basis for certifying satisfactory completion of course of study, in addition to the attendance requirement.

5.8 :

LOGBOOK

DEPARTMENT OF ……..

MDS Programme

LOG BOOK OF

NAME……

BIODATA OF THE CANDIDATE

EXPERIENCE BEFORE JOINING P.G. COURSE

DETAILS OF POSTING:

- **FIRST YEAR**
- **SECOND YEAR**
- **THIRD YEAR**

DETAILS OF LEAVE AVAILED

PRECLINICAL EXERCISES

LIBRARY DISSERTATION

RESEARCH WORK

PARTICIPATION IN CONFERENCES – CDE PROGRAMMES

DETAILS OF PARTICIPATION IN ACADEMIC PROGRAMME

SEMINARS /SYMPOSIA PRESENTED

JOURNAL CLUBS

TEACHING ASSIGNMENTS – UNDERGRADUATES / PARAMEDICAL.

SPECIAL DUTIES (IF ANY)

INTERNAL ASSESSMENT

DAILY ACTIVITIES RECORD (BLANK PAGES)

ONE PAGE FOR EACH MONTH X 36 PAGES

MISCELLANEOUS

SUMMARY

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5.8.1 :LOGBOOK-1

ACADEMIC ACTIVITIES ATTENDED

Name:

Admission Year: College:

Date	Type of activity - Specify Seminar, Journal club, Presentation, UG teaching	Particulars

5.8.2 :LOG BOOK -2

ACADEMIC PRESENTATIONS MADE BY THE TRAINEE

Name:

Admission Year:

College:

Date	Topic	Type of activity - Specify Seminar, Journal club, Presentation, UG teaching

5.8.3 :LOG BOOK-3

DIAGNOSTIC AND OPERATIVE PROCEDURES PERFORMED

Name

Admission Year:

College:

Date	Name	OP No.	Procedure	Category **O,** A, PA, PI

Key:

O- WASHED UP AND OBSERVED - INITIAL 6 MONTHS OF ADMISSION A-

ASSISTED A MORE SENIOR SURGEON -1 YEAR MDS

PA - PERFORMED PROCEDURE UNDER THE DIRECT SUPERVISION OF A SENIOR SURGEON - II YEAR MDS PI-

PERFORMED INDEPENDENTLY - III YEAR MDS

REGULATIONS 2016

SYLLABUS

for Courses affiliated to the

Kerala University of Health Sciences

Thrissur 680596

Master of Dental Surgery (MDS)
Periodontology

Course Code: 242

(2016-17 Academic year onwards)

2016

2. COURSE CONTENT

2.1 Title ofcourse:

MDS Periodontology

2.2 Objectives ofcourse

1. **Goals**

The goals of postgraduate training in various specialities are to train the BDS graduate who will:

- Practice respective specialty efficiently and effectively, backed by scientific knowledge and skill.
- Exercise empathy and a caring attitude and maintain high ethical standards.
- Continue to evince keen interest in continuing professional education in the specialty and allied specialties irrespective of whether in teaching or practice.
- Willing to share the knowledge and skills with any learner, junior or a colleague.
- To develop the faculty for critical analysis and evaluation of various concepts and views, to adopt the most rational approach.

2. **Objectives**

The objective is to train a candidate so as to ensure higher competence in both general and special area of interest and prepare him for a career in teaching, research and specialty practice. A candidate must achieve a high degree of clinical proficiency in the subject matter and develop competence in research and its methodology as related to the field concerned.

The above objectives are to be achieved by the time the candidate completes the course. The objectives may be considered as under –

1. Knowledge (CognitiveDomain)
2. Skills (PsychomotorDomain)
3. Human values, ethical practice and communication abilities.

2.1. Knowledge

- Demonstrate understanding of basic sciences relevant to the specialty.
- Describe etiology, pathophysiology, principles of diagnosis and management of common problem within the specialty in adults and children.
- Identify social, economic, environmental and emotional determinants in a given case and take them into account for planning treatment.
- Recognize conditions that may be outside the area of specialty/competence and to refer them to an appropriate specialist.
- Update knowledge by self-study and by attending courses, conferences and seminars relevant to specialty.

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- Undertake audit; use information technology and carry out research both basic and clinical with the aim of publishing or presenting the work at various scientific gatherings.

2.2. Skills

- Take a proper clinical history, examine the patient, perform essential diagnostic procedures and order relevant tests and interpret them to come to a reasonable diagnosis about the condition.
- Acquire adequate skills and competence in performing various procedures as required in the specialty.

2.3. Human values, ethical practice and communicationabilities

- Adopt ethical principles in all aspects ofpractice.
- Foster professional honesty and integrity.
- Deliver patient care, irrespective of social status, caste, creed, or religion of the patient.
- Develop communication skills, in particular skill to explain various options available in management and to obtain a true informed consent from the patient.
- Provide leadership and get the best out of his team in congenial working atmosphere.
- Apply high moral and ethical standards while carrying out human or animal research.
- Be humble and accept the limitations in his knowledge and skill and to ask for help from colleagues when needed.
- Respect patient's rights and privileges including patient's right to information and right to seek a second opinion.

2.3 Medium of instruction:

The medium of instruction for the course shall be English.

2.4 Course outline

Periodontics is the science dealing with the health and diseases of the investing and supporting structures of the teeth and oral mucous membrane.

2.5 Duration

The course shall be of **three years** duration. All the candidates for the degree of MDS are required to pursue the recommended course for at least three academic years as full time candidates in an institution affiliated to and approved for Postgraduate studies by KUHS, observing the norms put forward by the DCI.

i. There will be no reduction for the course duration for any of the students including service candidates, diploma holders and those who have done senior house surgeoncy or equivalent research experience.

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ii. No student shall be permitted to complete the course by attending more than 6 continuous years.
iii. A candidate selected for admission in a Dental College is obliged to follow the curriculum, rules and regulations as approved by the Dental Council of India and the University. Curriculum, rules or regulations are subject to changes from time to time.

2.6. Syllabus

The syllabus for the theory of Periodontology should cover the entire field of the subject and the following topics may be used as guidelines only and not limited to them.

The concept of health care counseling shall be in corporated in all relevant areas.

The theory examination in MDS Periodontology consists of four papers as given below.

Paper-I - Applied Anatomy, Physiology, Biochemistry, Pathology, Microbiology, Pharmacology and Biostatistics
Paper-II-Etiopathogenesis
Paper-III-Clinical Periodontology and Oral Implantology
Paper-IV -Essay

Syllabus distribution among the four papers

Paper I: Applied Anatomy, Physiology, Biochemistry, Pathology, Microbiology, Pharmacology and Biostatistics

1. Applied Anatomy:

1.1.Development of thePeriodontium
1.2.Micro and Macro structural anatomy and biology of the periodontal tissues
1.3.Age changes in the periodontal tissues
1.4.Anatomy of the Periodontium
1.4.1.Macroscopic and microscopic anatomy
1.4.2.Blood supply of the Periodontium
1.4.3.Lymphatic system of the Periodontium
1.4.4.Nerves of thePeriodontium
1.5.Temporomandibular joint, Maxillae and Mandible
1.6.Cranial nerves **5,7,9,11,12.**
1.7.Tongue,oropharynx
1.8.Muscles of mastication

2.Physiology

1. Blood
2.Respiratory system

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3. Cardiovascularsystem

3.1.Blood pressure

3.2.Normal ECG

3.3.Shock

4. Endocrinology - hormonal influences on Periodontium

5. Gastrointestinal system

5.1.Salivary secretion-composition,function & regulation

5.2.Reproductive physiology

5.2.1.Hormones- Actions and regulations, role in periodontal disease

5.2.2.Family planning methods

6. Nervous system

6.1.Pain pathways

6.2.Taste -Taste buds, primary taste sensation & pathways for sensation

3. Biochemistry

3.1.Basics ofcarbohydrates, lipids, proteins, vitamins, proteins, enzymes and minerals

3.2.Diet and nutrition and periodontium

3.3.Biochemical tests and their significance

3.4.Calcium and phosphorus

4. Pathology

4.1.Cell structure and metabolism

4.2.Inflammation and repair,necrosis and degeneration

4.3.Immunity and hypersensitivity

4.4.Circulatory disturbances - edema, hemorrhage, shock, thrombosis, embolism, infarction and hypertension

4.5.Disturbances of nutrition

4.6.Diabetes mellitus

4.7.Cellular growth and differentiation, regulation

4.8.Lab investigations

4.9. Blood

5. Microbiology:

5.1. General bacteriology

5.1.1 Identification of bacteria

5.1.2.Culture media and methods

5.1.3.Sterilization and disinfection

5.2. Immunology and Infection

5.3. Systemic bacteriology with special emphasis on oral microbiology - Staphylococci, genus Actinomyces and other filamentous bacteria and Aggregatibacter actinomycetumcomitans

5.4.Virology

5.4.1.General properties of viruses

5.4.2.Candidasis

5.5.Applied microbiology

5.6.Diagnostic microbiology and immunology, hospital infections and management

6. Pharmacology:

6.1.General pharmacology

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6.1.1.Definitions - pharmcokinetics with clinical applications, routes of administration including local drug delivery in periodontics

6.1.2.Adverse drug reactions and drug interactions

6.2.Detailed pharmacology of

6.2.1.Analgesics - opiod and nonopiod

6.2.2.Local anesthetics

6.2.3.Haematinics and coagulants, anticoagulants

6.2.4.Vitamin d and calcium preparations

6.2.5.Antidiabetics drugs

6.2.6.Steroids

6.2.7.Antibiotics

6.2.8.Antihypertensive

6.2.9.Immunosuppressive drugs and their effects on oraltissues

6.2.10.Antiepilepticdrugs

6.3.Brief pharmacology, dental use and adverse effects of

6.3.1.General anesthetics

6.3.2.Antypsychotics

6.3.3.Antidepressants

6.3.4..Anxiolytic drugs

6.3.5.Sedatives

6.3.6.Antiepileptics

6.3.7.Antihypertensives

6.3.8.Antianginal drugs

6.3.9.Diuretics

6.3.10.Hormones

6.3.11.Pre-anesthetic medications

6.4.Drugs used in bronchial asthma cough

6.5.Drug therapy of

6.5.1.Emergencies

6.5.2.Seizures

6.5.3.Anaphylaxis

6.5.4.Bleeding

6.5.5.Shock

6.5.6.Diabetic ketoacidosis

6.5.7.Acute addisonian crisis

6.6.Dental pharmacology

6.6.1.Antiseptics

6.6.2.Astringents

6.6.3.Sialogogues

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6.6.4.Disclosing agents
6.6.5.Antiplaque agents

6.7.Fluoride pharmacology

7.Biostatistics:

7.1.Introduction, definition and branches of biostatistics

7.2.Collection of data, sampling, types, bias and errors

7.3.Compiling data-graphs and charts

7.4.Measures of central tendency (mean, median and mode), standard deviation variability

7.5.Tests of significance (chi square test 't'test and Z-test)

7.6.Null hypothesis

8.Research Methodology

8.1.What is research?

8.2.What is research methodology

8.3.Study Designs

8.4.Epidemiological studies, Observations, Descriptive, Cohort case control studies.

8.5.Experimental, Clinical trials (Randomized control), Community trends (Non randomized)

9. Infection Control

9.1.HIV and AIDS

9.2.Viral hepatitis

9.3.Aseptic techniques

9.4. Sterilization with special reference to dental office.

9.5.Dental control unit water systems and handpiece asepsis

9.6.Infection control of impressions

9.7.Cross infection

10. Dental Radiology

10.1.Introduction
10.2.Sources
10.3.Principles of x-ray production
10.4.Radiographic Principles And Technique
10.5.Advanced radiographic techniques – Subtraction radiography, CT, CBCT

11. Ethics in Dentistry

11.1.Introduction to ethics:

11.2.What is ethics?

11.3.What are values and norms?

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11.4.How to form a value system in one's personal and professional life?

11.5.Hippocratic oath.

11.6.Ethics of the Individual

11.6.1.The patient as a person

11.6.2.Right to be respected

11.6.3.Truth and confidentiality

11.6.4.Autonomy of decision

11.7.Doctor patient relationship

11.7.1.Professional Ethics

11.7.2.Code of conduct

11.7.3.Contract and confidentiality

Paper II :Etiopathogenesis

2.1.Classification of periodontal diseases and conditions

2.2. Epidemiology of gingival and periodontal diseases

2.3.Defense mechanisms of gingiva

2.4.Periodontal microbiology

2.5.Basic concepts of inflammation and immunity

2.6.Microbial interactions with the host in periodontal diseases

2.7.Pathogenesis of plaque associated periodontal diseases

2.8.Dental calculus

2.9.Role of iatrogenic and other local factors

2.10.Genetic factors associated with periodontal diseases

2.11.Influence of systemic diseases and disorders of the periodontium

2.12 .Role of environmental factors in the etiology of periodontal disease

2.13.Stress and periodontal diseases

2.14.Occlusion and periodontal diseases

2.15.Smoking and tobacco in the etiology of periodontal diseases

2.16.AIDS and periodontium

2.17. Periodontal medicine

2.18.Dentinal hypersensitivity

Paper III :Clinical and Therapeutic Periodontology and Oral Implantology

Clinical periodontology includes gingival diseases, periodontal diseases, periodontal instrumentation, diagnosis, prognosis and treatment of periodontal diseases.

3.1.GINGIVAL DISEASES

3.1.1 Gingival inflammation

3.1.2.Clinical features of gingivitis

3.1.3.Gingival enlargement

3.1.4.Acute gingival infections

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3.1.5.Desquamative gingivitis and oral mucous membrane diseases

3.1.6.Gingival diseases in the childhood

3.2. PERIODONTALDISEASES

3.2.1.Periodontal pocket

3.2.2.Bone loss and patterns of bone destruction

3.2.3.Periodontal response to external forces

3.2.4.Masticatory system disorders

3.2.5.Chronic periodontitis

3.2.6.Aggressive periodontitis

3.2.7.Necrotising ulcerative periodontitis

3.2.8.Interdisciplinary approaches

3.2.8.1.Orthodontic

3.2.8.2.Endodontic

3.2.8.3.Periodontic considerations

3.3.TREATMENT OF PERIODONTAL DISEASES

3.3.1.History, examination, diagnosis, prognosis and treatment planning

3.3.1.1.Clinical diagnosis

3.3.1.2.Radiographic and other aids in the diagnosis of periodontal diseases

3.3.1.3.Advanced diagnostic techniques

3.3.1.4.Risk assessment

3.3.1.5.Determination of prognosis

3.3.1.6.Treatment plan

3.3.1.7.Rationale for periodontal treatment

3.3.1.8.General principles of anti-infective therapy with special emphasis on infection control in periodontal practice

3.3.1.9.Halitosis and its treatment

3.3.1.10.Bruxism and its treatment

3.3.2.Periodontal instrumentation

3.3.2.1Instrumentation

3.3.2.2.Principles of periodontal instrumentation

3.3.2.3.Instruments used in different parts of the mouth

3.3.3.Periodontal therapy

3.3.3.1.Preparation of tooth surface

3.3.3.2.Plaque control

3.3.3.3.Antimicrobial and other drugs used in periodontal therapy and wasting diseases of teeth

3.3.3.4 .Periodontal management of HIV infected patients

3.3.3.5. Occlusal evaluation and therapy in the management of periodontal diseases

3.3.3.6. .Role of orthodontics as an adjunct to periodontal therapy

3.3.3.7 .Special emphasis on precautions and treatment for medically compromised patients

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3.3.3.8.Periodontal splints

3.3.3.9.Management of dentinal hypersensitivity

3.3.4.Periodontal surgical phase- special emphasis on drug prescription

3.3.4.1.General principles of periodontal surgery

3.3.4.2.Surgical anatomy of periodontium and related structures

3.3.4.3.Gingival curettage

3.3.4.5.Gingivectomy technique

3.3.4.6.Treatment of gingival enlargements

3.3.4.7.Periodontal flap

3.3.4.8.Osseous surgery (resective andregenerative;

3.3.4.9.Furcation; Problem and its management

3.3.4.10.The periodontic – endodontic continuum

3.3.4.11.Periodontic plastic and esthetic surgery

3.3.4.12.Recent advances in surgical techniques

3.3.5. Future directions and controversial questions in periodontal therapy

3.3.5.1.Future directions for infection control

3.3.5.2.Research directions in regenerative therapy

3.3.5.3.Future directions in anti-inflammatory therapy

3.3.5.4.Future directions in measurement of periodontal diseases

3.3.6.Periodontal maintenance phase

3.3.6.1.Supportive periodontal treatment

3.3.6.2.Results of periodontal treatment

3.3.7.Periodontalin strumentation

3.3.7.1.Instrumentation

3.3.7.2.Principles of periodontal instrumentation

3.3.7.3.Instruments used in different parts of the mouth

3.3.8.Periodontal therapy

3.3.8.1.Preparation of tooth surface

3.3.8.2.Plaque control

3.3.8.3.Antimicrobial and other drugs used in periodontal therapy and wasting diseases

3.3.9.ORAL IMPLANTOLOGY

3.3.9.1 Introduction and historical review

3.3.9.2.Biological, clinical and surgical aspects of dental implants

3.3.9.3.Diagnosis and treatment planning

3.3.9.4.Implant surgery

3.3.9.5.Prosthetic aspects of dental implants

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3.3.9.6.Diagnosis and treatment of Peri-implant complications

3.3.9.7.Special emphasis on plaque control measures implant patients

3.3.9.9.Maintenance phase

3.3.10.MANAGEMENT OF MEDICAL EMERGENCIES IN PERIODONTAL PRACTICE

Paper IV : Essay. (Essay on any of the topics in Periodontology with emphasis on recent advances.)

FIRST YEAR MDS

EVIDENCE-BASED DECISION MAKING

- Introduction to Evidence-Based Decision Making
- Assessing Evidence
- Implementing Evidence-based Decisions in Clinical Practice

THE NORMAL PERIODONTIUM

- The Gingiva
- The Tooth-Supporting Structures
- Aging and the Periodontium

CLASSIFICATION AND EPIDEMIOLOGY OF PERIODONTAL DISEASES

- Classification of Diseases and Conditions Affecting the Periodontium
- Epidemiology of Gingival and Periodontal Diseases

PHARMACOLOGY

- Drug administration – modes, physiology, toxicology of antibiotics.
    - Tetracycline. Metronidazole, Penicillins, Cephalosporins, Clindamycin, Ciprofloxacin, Macrolides, AntifungalDrugs
    - Local Drug Delivery Systems
    - Periodontal Dressing
    - Antibiotic Prophylaxis in medically compromised patients
    - Anticoagulants and Antiplatelet drugs with special reference to the periodontium
    - Antiepileptic drugs with special reference to the periodontium
    - Antihypertensive drugs with special reference to Calcium channel blockers
    - Immunosuppressive drugs. with special reference to the periodontium
- Antiseptics, disinfectants and mouthwashes.
- Analgesics and anti-inflammatory drugs
- Astringents
- General and local anesthesia – indications and contraindications premedication and anesthetics in different clinical situations.
- Condition with special reference to periodontics.
    - Nutritional Influences–
        - General
        - Vitamin A Deficiency.
        - Vitamin B Complex deficiency and the Periodontium.
        - Role of Vitamin C in the Periodontium.
        - Vitamin D, Calcium, Phosphorus and the Periodontium..
        - Vitamin E,K,
        - Protein deficiency.

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        - Minerals
    - Endocrine Disorders–
        - Diabetes Mellitus,
        - Hyperparathyroidism, Hyperthyroidism
        - Sex Hormones
    - Hematologic Disorders
        - Leukaemia
        - Anaemia.
        - Agranulocytosis
        - Polycythemia.
        - Hemophilia,
        - Thrombocytopenia
    - Metal Intoxication–
        - Bismuth
        - Lead
        - Mercury
    - Otherchemicals
- Emergency drugs in dental practice.
- Calcium channel blockers.
- Immunosuppressive drugs.
- Biotransformation of drugs.
- Antibiotics sensitivity tests.

MATERIAL SCIENCE

- Foreign body reactions in tissues.
- Composite Resins and Glass Ionomer Cements.
- Biological aspects of GTR therapy.
- Biological aspects of Synthetic bone graft materials.
- Splinting ofTeeth
- Dental Implants – Various Implant Systems.

SECOND YEAR MDS

ETIOLOGY OF PERIODONTAL DISEASES

- Microbiology of Periodontal Diseases
- The role of dental calculus and other predisposing factors
- Genetic factors associated with periodontal disease
- Immunity and Inflammation: Basic Concepts
- Microbial interactions with the host in periodontal diseases
- Smoking and periodontal disease
- Molecular Biology of the host-microbe interaction in periodontal diseases: Selected Topics: Molecular signalling aspects of pathogen-mediated bone Destruction in periodontal disease
- Host Modulation

RELATIONSHIP BETWEEN PERIODONTAL DISEASE AND SYSTEMIC HEALTH

- Influence of systemic disorders and stress on the periodontium
- Periodontal medicine: impact of periodontal infection on systemic health
- Oral malodour

PERIODONTAL PATHOLOGY

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1. GINGIVAL DISEASE

- Defence mechanisms of the gingiva
- Gingival inflammation
- Clinical features of gingivitis
- Gingival enlargement
- Acute gingival infections
- Gingival diseases in childhood
- Desquamative gingivitis

2. PERIODONTAL DISEASE

- The Periodontal Pocket
- Bone Loss and Patterns of Bone Destruction
- Periodontal Response to External Forces
- Masticatory System Disorders
- Chronic Periodontitis
- Necrotizing Ulcerative Periodontitis
- Aggressive Periodontitis
- Pathology and Management of Periodontal Problems in Patients with HIV Infections

III YEAR MDS

TREATMENT OF PERIODONTAL DISEASE

1. DIAGNOSIS, PROGNOSIS AND TREATMENT PLAN

- Clinical Diagnosis
- Radiographic Aids in the diagnosis of Periodontal Disease
- Advanced Diagnostic Techniques
- Risk Assessment
- Levels of Clinical Significance
- Determination of Prognosis
- The Treatment Plan
- Rationale for Periodontal Treatment
- Periodontal Therapy in the Female Patient
- Periodontal Treatment of Medically Compromised Patients
- Periodontal Treatment for Older Adults
- Treatment of Aggressive and Atypical Forms of Periodontitis

2. TREATMENT OF PERIODONTAL EMERGENCIES

- Treatment of acute gingival disease
- Treatment of periodontal abscess

3. NONSURGICAL THERAPY

- Phase I Therapy
- Plaque control for the periodontal patient
- Scaling and root planing
- Chemotherapeutic agents
- Host modulation agents
- Sonic and ultrasonic instrumentation
- Supragingival and Subgingival Irrigation
- Occlusal Evaluation and Therapy
- Adjunctive role of Orthodontic therapy
- Periodontic- Endodontic continuum

4. SURGICALTHERAPY

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- Phase II Periodontal therapy
- General principles of Periodontal Surgery
- Surgical Anatomy of the periodontium and related structures
- Gingival Surgical Techniques
- Treatment of Gingival enlargement
- The periodontal Flap
- Flap technique for pocket therapy
- Resective osseous Surgery
- Reconstructive Periodontal surgery
- Furcation - Involvement and treatment
- Periodontal plastic and aesthetic surgery
- Recent advances in Surgical technology

5. PERIODONTAL RESTORATIVE INTERRELATIONSHIPS

- Preparation of periodontium for restorative dentistry
- Restorative interrelationships

ORAL IMPLANTOLOGY

1. Biological aspects of oral implants
2. Clinical aspects and evaluation of implant patient
3. Diagnostic imaging for the implant patient
4. Standard implant surgical procedures
5. Localised Bone augmentation and Implant site development
6. Advanced implant surgical procedures
7. Recent advances in implant surgical technology
8. Biomechanics, Treatment planning and prosthetic considerations
9. Implant related complications and failures

PERIODONTAL MAINTENANCE

1. Supportive periodontal treatment
2. Results of periodontal treatment

ETHICAL, LEGAL, AND PRACTICAL ISSUES IN THE MANAGEMENT OF PERIODONTAL PATIENTS

1. Dental ethics
2. Legal principles :Jurisprudence
3. Dental insurance and Managed Care in Periodontal Practice

STRUCTURED TRAINING SCHEDULE

FIRST YEAR

1 Clinical cases:

i. Practice of incision and suturing techniques on typhodont models
ii. X ray techniques and interpretations
iii. Local anesthetic techniques
iv. Basic diagnostic microbiology and immunology, collection & handling samples, culturing techniques.
v. Practical training on basic life support devices.
vi. Basic Biostatistics. Survey & data analysis.
vii. Applied periodontal Indices 10Cases
viii. Scaling & Root planing 50 cases
ix. Ultrasonic scaling 50 cases.
x. Curettage 15Cases.
xi. Local Drug Delivery 10 cases
xii. Gingivectomy & Gingivoplasty 5cases.

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2 **Seminars:** One Seminar per week to be conducted in the department. A minimum of five seminars should be presented by each student each year. A minimum of 30 seminars should be attended by each student each year.

3 **Journal club**: One Journal club per week to be conducted in the department. A minimum of five journal clubs should be presented by each student each year . A minimum of 30 journal clubs should be attended by each student each year.

4 Protocol for library dissertation to be submitted on or before the end of six months from the date of admission. Library dissertation should be submitted at the end of first year.

5 Synopsis for dissertation to be submitted at the end of first year.

6 Under graduate classes: Around 4-5 classes should be handled by each post- graduate student.

7 Field survey: To be conducted and submit the report

8 Inter – department meetings: should be held once in 3months.

9 Case discussions

10 Field visits: To attend dental camps and to educate the masses

11 Basic subjects classes

12 Internal assessment or Term paper

13 Scientific paper and poster presentations at various conferences and post graduate workshops.

SECOND YEAR:

1 **C**linicalwork

i. Case history & treatment planning 5cases.

ii. Periodontal surgical procedures 50surgeries

a. Pocket therapy
b. Mucogingival surgery
c. Perio-endo problems
d. Periosplint
e. Occlusal adjustment

iii. Implant - 1case

2 Seminars: One Seminar per week to be conducted in the department. A minimum of five seminars should be presented by each student each year. A minimum of 30 seminars should be attended by each student each year.

3 Journal club: One Journal club per week to be conducted in the department. A minimum of five journal clubs should be presented by each student each year. A minimum of 30 journal clubs should be attended by each student each year.

4 Undergraduate classes: Each post- graduate student should handle around 4-5 classes.

5 Inter –departmental meetings: Should be held once in 3 months

6 Case discussions

7 Field visits: To attend dental camps and to educate the masses.

8 Dissertation work: On getting the approval from the university work for the dissertation to be started.

9 Scientific paper and poster presentations at various conferences and post graduate work shops.

THIRD YEAR

1 **Clinicalwork**

i. Surgeries - 20

ii. Including 10 Surgeries using Regenerative surgical techniques -graft material & membranes

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2 Seminars- One Seminar per week to be conducted in the department. Each student should present a minimum of five seminars each year.
3 Journal Club: One Journal club per week to be conducted in the department.
4 Under graduate classes: each post –graduate student, should handle around 4-5classes.
5 Inter departmental meetings: Should be held once in a month.
6 The completed dissertation should be submitted six months before the final examination
7 Case discussions
8 Field visits: To attend dental camps and to educate the masses.
9 Finishing and presenting the cases taken up.
10 Preparation of finished cases and presenting the cases (to be presented for the examination).
11 Maintenance of record and log book of all cases done during post graduate training period
12 Mock examination

NOTE: All documents of the treated cases and seminar topics duly attested by the concerned guide should be submitted prior to the Clinical/Practical University Examination.

2.7.Total number of hours

As per the instruction given by the DCI.

2.8.Branches if any with definition

Present in clause 2.6

2.9.Teaching learning methods

Method of Training

The training of a postgraduate student shall be full time but graded responsibilities in the management and treatment of patients entrusted to his/her care. The participation of the students in all facets of educational process is essential. Every candidate should take part in seminars, group discussions, case demonstrations, clinics, journal review meetings, and clinical meetings. Every candidate shall be required to participate in the teaching and training programme of undergraduate students and interns. Training should include involvement in laboratory and experimental work, and research studies. Every Institution under taking Post Graduate training programme shall set up an Academic cell or a Curriculum Committee, under the chairmanship of a Senior faculty member, which shall work out the details of the training programme in each speciality in consultation with other Department faculty staff and also coordinate and monitor the implementation of these training Programmes.

Based on the above guidelines for a structured training programme for postgraduate courses, the basic tenets of a successful postgraduate teaching programme, are detailed under the following heads.

- **Formal Lectures** by the faculty on varied subjects including general areas and systems. Both senior and junior faculty can do this. However, the number of these classes should be maintained of low levels to encourage self-learning.

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- **Symposia / Seminars** form an integral part of PG learning. A monthly symposium will generate approximate 30-35 symposia / course. These symposia can include department faculty and HODs as chairpersons and maximum involvement of both students and faculty should beensured.
- **Clinical Discussions** form the core of PG training and can be assigned to various clinical units on rotating basis. However other faculty could also actively participate in the discussion. The discussions must be 3-4/week. One suggestion is to score the performance of the candidate by a small panel of faculty and convey the scores to the candidate / PG at the end of the session.
- **Journal Club /Clinical Club** should be conducted at least once in a week in each postgraduate department. Journal clubs not only imparts new information but also trains the candidate to objectively assess and criticize various articles which come out and should be useful in ensuring evidence based dentistry.
- **Guest Lectures** can be integrated into the PG program at least once in a month. Even the retired faculty can be invited for delivering the lectures and will ensure importing of greater wisdom to thecandidates.
- **Orientation Classes** for newcomers should also be incorporated. These classes can even be assigned to junior faculty/senior PGs.
- **Clinical posting.** Each PG student should work in the clinics on regular basis to acquire adequate professional skills and competency in managing various cases to be treated by aspecialist.
- **Clinico Pathological Conferences** should be held once a year involving the faculties of Oral Medicine and Radiology, Oral Pathology and concerned clinical department. The student should be encouraged to present the clinical details, radiological and histo- pathological interpretations and participation in the discussions.
- **Rotation postings in other departments** should be worked out by each department in order to bring in more integration between the speciality and allied fields.
- **Periodical Quiz** can be both informative and entertaining and should be encouraged and planned.
- **Computer Training and Internet Applications** are now becoming a must for both faculty and students. These areas should be strengthened as a next step. There can be a sort of internet information club in the departments.
- **Conferences/CDEs** – All postgraduate students should be encouraged to attend conferences and CDEs. They should also be asked to present papers wherever appropriate and should be rewarded by assigning scores for them.
- **Publication of scientific papers** – It is desirable and advisable to have at least two publications in the State/National/International indexed dental journals.
- **Involvement in Teaching Activity** – PG students can be assigned the job of teaching the undergraduate students and these will definitely improve the teaching skills in the postgraduate students.

Examinations

Evaluation is a continuous process, which is based upon criteria developed by the concerned authorities with certain objectives to assess the performance of the learner. This also indirectly helps in the measurement of effectiveness and quality of the concerned MDS programme. Evaluation is achieved by two processes

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1) Formative or internal assessment

2) Summative or university examinations.

Formative evaluation is done through a series of tests and examinations conducted periodically by the institution. Summative evaluation is done by the university through examination conducted at the end of the specified course. A candidate registered for MDS course must clear the final examination within six years of the date of admission. The examinations should be so organized that this shall be used as the mechanism to confirm that the candidate has acquired appropriate knowledge, skill and competence at the end of the training that he/she can act as a specialist and/or a medical teacher as per expectation. University examination will be held regularly by KUHS in April-May/October-November every year.

A candidate who wishes to study for MDS in a second specialty should have to take the full course of 3 years in that specialty and appear for examinations.

2.10 Content of each subject in each year

Present in clause2.6

2.11 No: of hours per subject (lecture-tutorial-seminar-groupdiscussion)

Present in clause2.6

2.12 .Practical training given in labs/supervision (No: of hours for eachexercise/training)

Present in clause2.6

2.13 Records

Present in clause2.20

2.14 Dissertation: As per Dissertation Regulations of KUHS

Every candidate pursuing MDS degree course is required to carry out work on a selected research project under the guidance of a recognized postgraduate teacher. The results of such a work shall be submitted in the form of a dissertation.

The dissertation is aimed to train a postgraduate student in research methods and techniques. It includes identification of a problem, formulation of a hypothesis, search and review of literature, getting acquainted with recent advances, designing of a research study, collection of data, critical analysis, and comparison of results and drawing conclusions.

Every candidate shall submit to the University in the prescribed format a synopsis containing particulars of proposed dissertation work after obtaining ethical clearance from the Institutional Ethical Committee **within six months from the date of commencement of the course or before the dates notified by the University**. The synopsis shall be sent only through the Principal of the institution.

Such synopsis will be reviewed and the dissertation topic will be registered by the university. No change in the dissertation topic or guide/coguide shall be made without prior approval of the University. The dissertation should not be just a repetition of a previously

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undertaken study but it should try to explore some new aspects. The dissertation should be written under the following headings:

Introduction

i. Aims and Objectives of the study
ii. Review ofLiterature
iii. Methodology
iv. Results
v. Discussion
vi. Conclusion
vii. Summary
viii. References
ix. Annexures

The written text of dissertation shall be not less than 50 pages and shall not exceed 150 pages excluding references, tables, questionnaires, and other annexures. It should be neatly typed (font size 13-Times New Roman or font size 13-Cambria) in 1.5 line spacing on one side of the paper (A4 size, 8.27" x 11.69") and bound properly. Spiral binding should be avoided. (Refer KUHS Website). The guide, co-guide if any, Head of the Department and the Head of the Institution shall certify the dissertation.

For uniformity, it was suggested that the colour of the hard bind of the dissertation for all branches of MDS course in the purview of KUHS shall be dark brown with letters of gold colour. The title, author, and year of study should also be imprinted or embossed on the spine of the book. **Three hard copies and one properly labeled soft copy in a CD (refer KUHS Website) of the dissertation thus prepared shall be submitted to KUHS on the 29th month of commencement of the course / 31st Oct. of the 3rd academic year, whichever falls first.** Dissertation should preferably be sent to a minimum of three reviewers / examiners /assessors, of which two shall be from outside the state and one from the affiliated colleges o KUHS. If modifications are to be made as specified, three hard copies and one soft copy of the dissertation after corrections made by the candidate should be submitted with in a minimum of 30 days to the University. Consent for acceptance for evaluation of dissertation should be obtained from the reviewer/examiner/assessor before the dissertations are despatched. Proforma for evaluation of dissertation should be sent along with the copies of the dissertation to the reviewers appointed by the university. The proforma should contain all the assessment criteria with the clause – **Accepted/Accepted with modifications/Rejected** and reasons for rejection by the examiner. This proforma should be sent back to the University within two weeks / within the date specified after receipt of dissertation. The dissertation may be declared accepted if more than 50% of the reviewers (2 in the case of 3 reviewers) have accepted it. If modifications are to be made as specified, 3 hard copies and one soft copy of the dissertation after corrections made by the candidate should be submitted within 30 days to the University which may be sent back to the same examiner/s by the University for Acceptance after a fee has been levied from the candidate. If the dissertation has been rejected by more than 50% of the reviewers (2 in the case of 3 reviewers), the dissertation may be reviewed by an Expert Reviewing Committee comprising of not less than two subject experts, Dean (Research) of KUHS and Guide of the candidate provided the Guide

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requests for a review, after a fee has been levied from the candidate. If rejected by the Reviewing Committee, the candidate should take up a new topic and undergo all the procedures of submitting the synopsis, fees, IEC clearance, etc as prescribed by the University. The candidate who takes up the new topic can appear only for the subsequent examination.

Approval of dissertation work is an essential precondition for a candidate to appear in the University examination. Hall tickets for the university examination should be issued to the candidate only if the dissertation has been accepted.

A candidate whose dissertation has been accepted by the examiners and approved by the University, but who is declared to have failed at the final examination will be permitted to reappear at the subsequent MDS examination without having to prepare a dissertation.

Guide – The academic qualification and teaching experience required for recognition by the University as a guide for dissertation work is as laid down by the Dental Council of India / KUHS.

Co-guide – A co-guide may be included provided the work requires substantial contribution from the same department or a sister department or from another institution recognized for teaching/training by KUHS/DCI. The co-guide should fulfill the academic qualification and teaching experience required for recognition by the University as a co-guide for dissertation work.

Change of Guide – In the event of a registered guide leaving the college for any reason or in the event of death of guide, guide may be changed with prior permission from the University.

2.15 Speciality training ifany

Present in clause2.6

2.16 .Project work to be done ifany

Present in clause 2.6

2.17. Any other requirements [CME, Paper Publishingetc.]

Present in clause2.6

2.18. Prescribed/recommended textbooks for eachsubject

<u>Applied Basic Sciences</u>

SUBJECT	NAME OF AUTHOR	NAME OF BOOK
Anatomy	BD Chaurasia	BD Chaurasia's Human Anatomy
	William, Peter L	Grays Anatomy
	Ash, Major M	Wheelers Dental Anatomy, Physiology and Occlosion

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Oral Anatomy	Sicher, Harry, Du Brull , Llyod	Oral Anatomy
Oral Histology	Bhaskar B.N. Ed	Orbans Oral Histology and Embryology
	Avery, James K	Essentials of Oral Histology and Embryology
Embryology	Sadler	Langmans Medical Embryology
	Inderbeer Singh	Human Embryology
Physiology	Guyton Arthur and John L Hall	Text Book of Medical Physiology
	Ganong, William F	Review of Medical Pysiology
Pharmacology	KD Tripathi	Essentials of Medical Pharmachology
	Hardman, Joel G	Goodman and Gillmans pharmacological basis of Therapeutics
Nutrition	Nizel	Nutrition in Preventive Dentistry: Science and Practice
General Pathology	Cotran, Ramzi S and Others	Robbins Pathologic Basis of Disease
	Harsh Mohan	Textbook of Pathology
Oral Pathology	Shaffer, William and Others	Textbook of Oral Pathology
	Neville, Brad W and Others	Oral and Maxillofacial Pathology
Microbiology	Ananthanarayan and Panicker	Textbook of Microbiology
	Lakshman S	Essential Microbiology for Dentistry
Biostatistics	Dr. Symalan	Statistics in Medicine
	Soben Peter	Essentials of Preventive and Community Dentistry
	Sunder Rao and Richard J.	Introduction to Biostatistics and Research Methods

Periodontology

1. Clinical Periodontology,10th Edition — Fermin A.Carranza Jr. Michael G. Newman
2. Contemporary Periodontics — Genco
3. Decision making in Periodontology,3rd edn — Walter BurnellHall
4. Periodontology color guide — Heasman, Preshaw,Smith
5. Essentials of Periodontics,4th edition — Hoag
6. Outline of Periodontics — J. D. Manson, B. M.Eley
7. Colour atlas of Periodontal Surgery — Jeffrey DJohnson
8. Periodontal Medicine, Surgery and Implants — Louis F Rose, Brian L Mealey,Robert G Jenco, D Walter Cohen
9. Contemporary Periodontal Instrumentation — DianeSchoen
10. Clinical Guide to Periodontics — Murray Schwartz
11. Periodontics- in the tradition of Gottlieb& — D A Grant, Irving BSterm
12. Orban — Max A Listgarten
13. Clinical Periodontology and Implant Dentistry — JanLindhe
14. Geriatric Dentistry- Ageing and oral health — Ash & Ramfjord
15. Occlusion — Mash & Marcus L Ward

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16. Evaluation, Diagnosis and Treatment of occlusal problems — Dawson
17. Implant Prosthodontics Clinical & Laboratory Procedures — Fagan
18. Implant Prosthodontics Surgical & Prosthetic Procedures — Fredrickson
19. Endosteal Dental Implants — McKinney
20. Contemporary Implant Dentistry — CEMisch
21. Change your Smile — Goldstein
22. Successful Restorative Dentistry — Prof. A. D.Wamsley
23. The Periodontal Ligament in Health and Disease — Berkovitz, B. J. Moxham, H.N. Newman
24. History of Dentistry — Hoffman/Asthet
25. Anatomical atlas of TMJ — Ide/Nakazann
26. Text book of occlusion — Moh/ Zarb/CasternRogh
27. Essentials of clinical periodontology and periodontics – ShanthipriyaReddy
28. Periodontics-medicine surgery and implants — Brean.l.Mealy,Louis.F.Rose
29. Clinical Periodontology-Current concepts — Dr.B.R.R.Varma&R.P.Nayak
30. Text book of Periodontology — Dr.GururajaRao
31. Color Atlas Of Dental Medicine: Periodontology — WolfRateitschak-Pluss, Rateitschak-Hassell
32. Plastic - Esthetic Periodontal and Implant Surgery — Otto Zuhr MarcHurzeler
33. Periodontal Surgery: A Clinical Atlas of Mucogingival Esthetic surgery — NaoshiSato, Giovanni Zucchelli

2.19. Reference books

As recommended by the HOD

2.20 Journals

1. Journal of Periodontal Research
2. Journal of Periodontology
3. Journal of Oral Implantology
4. Journal of Clinical Periodontology
5. Periodontology2000
6. I.S.P Journal
7. International journal of oral implantology and clinical research
8. International journal of clinical implant dentistry
9. International Journal of Periodontics and Restorative Dentistry
10. British Dental Journal
11. Journal of American Dental Association
12. Dental Clinics of North America
13. Dental Quintessance
14. Australian Dental Journal
15. Journal of Indian Dental Association

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2.21.Log book

- **Work Diary / Log Book**

Logbooks serve as a document of the trainee's work. The trainee shall maintain this Logbook of the special procedures/operations observed/assisted/performed by him/her during the training period right from the point of entry and its authenticity shall be assessed weekly by the concerned Post Graduate Teacher / Head of the Department. This shall be made available to the Board of Examiners for their perusal at the time of his / her appearing at the Final examination. The logbook should record clinical cases seen and presented, procedures and tests performed, seminars, journal club and other presentations. Logbook entries must be qualitative and not merely quantitative, focusing on learning points and recent advances in the area and must include short review of recent literature relevant to the entry. A work diary containing all the various treatment done by the candidate in the course of the study should also be maintained. The work diary shall be scrutinized and certified by both the guide/co guide and Head of the Department and presented in the University practical/clinical examination.

3 EXAMINATIONS

3.1.Eligibility to appear for exams

Every candidate to become eligible to appear for the **MDS examination** shall fulfill the following requirements.

Attendance

Every candidate shall have fulfilled the attendance prescribed by the University during **each academic year** of the Postgraduate course. A candidate becomes eligible for writing the University examination only after the completion of 36 months from the date of commencement of the course. The candidates should have completed the training period before the commencement of examination.

Dissertation

Approval of the dissertation is a mandatory requirement for the candidate to appear for the university examinations.

Library Dissertation

Submission of library dissertation as per the regulations of DCI / KUHS is mandatory for a candidate to appear for the university examinations.

Progress and Conduct

Every candidate shall have participated in seminars, journal review meetings, symposia, conferences, case presentations, clinics and didactic lectures during each year as designed by the concerned department.

Work Diary and Logbook

Every candidate shall maintain a work diary and logbook for recording his/her

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participation in the training programmes conducted by the department. The work diary and logbook shall be verified and certified by the Head of the department.

The certification of satisfactory progress by the Head of the Department and Head of the Institution shall be based on the checklist given in 5.1 to5.8.

- **Students should note that in case they do not complete the exercises and work allotted to them within the period prescribed, their course requirements will be considered unfulfilled.**
- **Clinical Records, Work Diaries and Logbooks should be maintained regularly and approved by the guide, duly certified by the Head of the Department.**

3.2.Schedule of Regular/Supplementary exams

The MDS examination shall be held at the end of the third academic year. The university shall conduct two examinations in a year at an interval of four to six months between two examinations. **Not more than two examinations shall be conducted in an academic year.**

3.3. Scheme of examination showing maximum marks and minimum marks

MDS examination will consist of Written (Theory), Viva Voce, and Practical / Clinical examinations.

Written Examination (Theory) :300 Marks

Written examination shall consist of **four question papers**, each of three hours' duration. Each paper shall carry 75 marks. The type of questions in the first three papers will be two long essay questions carrying 20 marks each and five short essay questions each carrying seven marks. **There will be no options in the questions in the first 3 papers. Fourth paper will be a single essay question paper which will carry an option and the candidate is to answer only one of the essays.** Questions on recent advances may be asked in any or all the papers. **The syllabus for the theory papers of the concerned specialty should cover the entire field of the subject. Though the topics assigned to the different papers are generally evaluated under designated papers, a strict division of the subject may not be possible and some overlapping of topics is inevitable. Students should be prepared to answer overlapping topics.** The theory examinations shall be held sufficiently earlier than the practical/clinical examinations so that the answer books can be assessed and evaluated before the start of the practical/clinical examination. The total marks for the theory examination shall be 300.

Practical Examination : 200 Marks

In case of practical examination, it should aim at assessing competence and skills of techniques and procedures. It should also aim at testing student's ability to make relevant and valid observations, interpretation and inference of laboratory or experimental or clinical work relating to his/her subject for undertaking independent work as a specialist. The total mark for practical/clinical examinations shall be 200.

Viva voce :100 Marks

Viva voce examination shall aim at assessing depth of knowledge, logical reasoning, confidence and oral communication skills. The candidate may be given a topic for the pedagogy in the beginning of the clinical examination and asked to make a presentation on the topic for 8-10 minutes. The total marks shall be 100 of which 80 would be for the viva voce (20 marks/examiner) and 20 marks for the pedagogy.

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3.4.Papers in the examination

Paper-I - Applied Anatomy, Physiology, Biochemistry, Pathology and pharmacology
Paper-II- Etiopathogenesis
Paper-III- Clinical Periodontology and Oral Implantology
Paper-IV -Essay

3.5. Details of Theory examination

Distribution of topics for each paper will be as follows:

Paper I: Applied Basic Sciences: Applied Anatomy, Physiology, Biochemistry, Pathology, Microbiology, Pharmacology, Research Methodology and Biostatistics.
Paper II: Normal Periodontal structure, Etiology & Pathogenesis of Periodontal diseases, epidemiology as related to Periodontics

Paper III: Periodontal diagnosis, therapy & Oral implantology

Paper IV: Essay (with emphasis on recent advances in periodontics)

3.6. MODEL QUESTION PAPERS

MDS Periodontology

PAPER I – Applied Anatomy, Physiology, Biochemistry, Pathology, Microbiology, Pharmacology and Biostatistics

(Answer all questions)

Time: 3 hrs Maximum marks75

Long Essays **(2 x 20 =40marks)**

1. Describe the anatomy, histology and clinical relevance of cementum. Add a note on pathologies affecting cementum
2. Enumerate blood-clotting factors. Describe the mechanism of blood clotting after periodontal surgery

Short essays **(5x7=35marks)**

3. Sterilization and disinfection.
4. Vitamin C
5. HIV infection and periodontal consideration.
6 Tetracyclines.
7. Cohort Study.

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PAPER II –Etiopathogenesis of Periodontal Diseases

(Answer all questions)

Time: 3hrs Max marks:75

Long essays **(2 x 20= 40 marks)**

1. Discuss genetic factors associated with periodontal disease.
2. Discuss the risk factors for aggressive periodontitis

Short essays **(5x7=35marks)**

3. Etiological factors and impact of smoking in periodontal disease
4. Microorganisms associated with specific periodontal disease
5. Describe chemotaxins for neutrophils
6. Molecular characterization of gingipain protease genes
7. Segregation analysis of early onset periodontitis

PAPER III – – Clinical Periodontology and Oral Implantology

(Answer all questions)

Time: 3 hrs Maximum marks75

Long essays **(2 x 20 = 40marks)**

1. Describe principle of sonic and ultra-sonic instruments.
2. Describe the process of Osseo integration and the reasons for its failure.

Short essays **(5x7=35)**

3. Radiosurgery techniques and instruments
4. Matrix metalloproteinases
5. Burnout phenomenon
6. Implant bone interface
7. Guided bone regeneration

PAPER IV – Essay on Recent Advances in Periodontics

(Answer only one question)

Time:3 hours Max marks : 75

Evidence Based Periodontal Therapy

OR

Critically analyze the statement 'guided tissue regeneration with barrier membranes is not a total solution for periodontal reconstitution.'

3.7. Internal assessment component

Not applicable.

3.8. Details of practical/clinical exams

The clinical examination shall be of two days duration

1st day

Case discussion

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- Long case-One
- Short case -Two

Periodontal surgery - Periodontal flap surgery on a previously prepared case in one quadrant of the mouth after getting approval from the examiners

2nd day

Post-surgical review and discussion of the case treated on the 1st day
Presentation of pedagogy/dissertation.
All the examiners shall participate in all the aspects of clinical examinations / Viva Voce
Distribution of Marks for Clinical examination (recommended)

a) Long Case discussion	50
b) 2 short cases	50
c) Periodontal surgery	75
d) Post — operative review	25
Total	200

3.9. Number of examiners needed (Internal & External) and their qualifications

There shall be at least four examiners in each branch of study. Out of four, two (50%) should be external examiners and two shall be internal examiners. The qualification and teaching experience for appointment as an examiner shall be as laid down by the DCI. The external examiners shall ordinarily be invited from another recognized University from outside the state. An external examiner may ordinarily be appointed for the same institute for not more than two years consecutively. Thereafter he may be reappointed after an interval of one year. The same set of examiners shall ordinarily be responsible for the practical and oral part of the examination.

The Head of the Department shall ordinarily be one of the examiners and the chairperson of the Board of Examinations; second internal examiner shall rotate after every two consecutive examinations if there are more than two postgraduate teachers in the department other than the Head of the department. No person who is not an active Postgraduate teacher in that subject can be appointed as Examiner. However in case of retired personnel, a teacher who satisfies the above conditions could be appointed as examiner up to one year after retirement.

For the MDS examination, if there are no two qualified internal examiners in an institute the second internal examiner can be from a neighbouring DCI and KUHS approved / recognized Dental College having PG course in the specific speciality. This examiner should be an active PG teacher in the same speciality with the qualifications and experience recommended for a teacher for postgraduate degree programme. The examination can also be conducted by one qualified internal examiner and three qualified external examiners if there is no qualified second internal examiner.

Reciprocal arrangement of Examiners should be discouraged, in that, the internal examiner in a subject should not accept external examinership of a college from which the external examiner is appointed in his subject in the same academic year.

3.10. Details of viva:

Viva Voce :100 Marks

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i. Viva-Voce examination : 80 marks

All examiners will conduct viva-voce conjointly on candidate's comprehension, analytical approach, expression, interpretation of data and communication skills. It includes all components of course contents. It includes presentation and discussion on dissertation also.

iii. Pedagogy and thesis presentation : 10 +10 = 20 marks

4. INTERNSHIP

Not applicable in PG Courses

5. ANNEXURES

5.Check Lists for Monitoring: Log Book, Seminar Assessment etc.

CHECKLISTS and LOGBOOK

5.1: Checklist 1

Model Checklist for Evaluation of Preclinical Exercises

Name of Student: Date:

Name of the Faculty-in-charge:

Name of Exercise

Sl. No:	Items for observation during evaluation	Score
1	Quality of Exercise	
2	Ability to answer to questions	
3	Punctuality in submission of exercise	
4	TOTAL SCORE	

Performance	Score
Poor	0
Below Average	1
Average	2
Good	3
Very good	4

Signature of Faculty-in-charge

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5.2:Checklist 2

Model Checklist for Evaluation of Journal Review / Seminar Presentation

Name of Student: Date:

Name of the Faculty/Observer:

Name of Journal / Seminar:

Sl. No:	Items for observation during evaluation	Score
1	Relevance of Topic	
2	Appropriate Cross references	
3	Completeness of Preparation	
4	Ability to respond to questions	
5	Effectiveness of Audio-visual aids used	
6	Time Scheduling	
7	Clarity of Presentation	
8	Overall performance	
9	TOTAL SCORE	

Performance	Score
Poor	0
Below Average	1
Average	2
Good	3
Very good	4

Signature of Faculty/Observer

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5.3:Checklist 3

Model Checklist for Evaluation of Clinical Case and Clinical Work

Name of Student: Date:

Sl. No:	Items for observation during evaluation	Score
1	History	
	Elicitation	
	Completeness	
2	Examination	
	General Examination	
	Extraoral examination	
	Intraoral examination	
3	Provisional Diagnosis	
4	Investigation	
	Complete and Relevant	
	Interpretation	
5	Diagnosis	
	Ability to defend diagnosis	
6	Differential Diagnosis	
	Ability to justify differential diagnosis	
7	Treatment Plan	
	Accuracy	
	Priority order	
8	Management	
9	Overall Observation	
	Chair side manners	
	Rapport with patient	
	Maintenance of Case Record	
	Quality of Clinical Work	
	Presentation of Completed Case	
10	TOTAL SCORE	

Performance	Score
Poor	0
Below Average	1
Average	2
Good	3
Very good	4

Signature of Faculty/Observer

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5.4 :Checklist 4

Model Checklist for Evaluation of Library Dissertation Work

Name of Student: Date:

Name of the Faculty/Guide:

Sl. No:	Items for observation during evaluation	Score
1	Interest shown in selecting topic	
2	Relevance of Topic	
3	Preparation of Proforma	
4	Appropriate review	
5	Appropriate Cross references	
6	Periodic consultation with guide	
7	Completeness of Preparation	
8	Ability to respond to questions	
9	Quality of final output	
9	TOTAL SCORE	

Performance	Score
Poor	0
Below Average	1
Average	2
Good	3
Very good	4

Signature of Faculty/Guide

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5.5:Checklist 5

Model Checklist for Evaluation of Dissertation Work

Name of Student: Date:

Name of the Faculty/Guide/Co-guide:

Sl. No:	Items for observation during evaluation	Score	Performance	Score
1	Interest shown in selecting topic		Poor	0
2	Relevance of Topic		Below Average	1
3	Preparation of Proforma		Average	2
4	Appropriate review		Good	3
5	Appropriate Cross references		Very good	4
6	Periodic consultation with guide/co- guide			
7	Depth of Analysis / Discuss			
8	Ability to respond to questions			
9	Department Presentation of findings			
10	Quality of final output			
	TOTAL SCORE			

Signature of Faculty/Guide/Co-guide

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5.6:CHECKLIST-6

CONTINUOUS EVALUATION OF DISSERTATION WORK BY GUIDE/CO-GUIDE

Name of theTrainee: Date

Name of the Faculty/Observer:

Sl.No.	Items for observation during presentation	Poor 0	Below Average 1	Average 2	Good 3	Very Good 4
1.	Periodic consultation with guide / co- guide					
2.	Regular collection of case material					
3.	Depth of Analysis / Discussion					
4.	Department presentation of findings					
5.	Quality of final output					
6.	Others					
	Total score					

Signature of the guide / co-guide

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5.7 :CHECKLIST -7

OVER ALL ASSESSMENT SHEET

Name of the College: Date:

Name of Department:

Check List No	PARTICULARS	Name of trainee		
		First Year	Second Year	Third Year
1	Preclinical Exercises			
2.	Journal Review Presentation			
3.	Seminars			
4	Library dissertation			
5.	Clinicalwork			
6-	Clinicalpresentation			
7.	Teaching skill practice			
8.	Dissertation			
	TOTAL			

Signature of HOD **Signature ofPrincipal**

The above overall assessment sheet used along with the logbook should form the basis for certifying satisfactory completion of course of study, in addition to the attendance requirement.

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5.8:LOGBOOK

DEPARTMENT OF ……..

MDS Programme

LOG BOOK OF

NAME……..

BIODATA OF THE CANDIDATE

EXPERIENCE BEFORE JOINING P.G. COURSE

DETAILS OF POSTING :

i. **FIRST YEAR**
ii. **SECOND YEAR**
iii. **THIRD YEAR**

DETAILS OF LEAVE AVAILED

PRECLINICAL EXERCISES

LIBRARY DISSERTATION

RESEARCH WORK

PARTICIPATION IN CONFERENCES – CDE PROGRAMMES

DETAILS OF PARTICIPATION IN ACADEMIC PROGRAMME

SEMINARS /SYMPOSIA PRESENTED

JOURNAL CLUBS

TEACHING ASSIGNMENTS – UNDERGRADUATES / PARAMEDICAL.

SPECIAL DUTIES (IF ANY)

INTERNAL ASSESSMENT

DAILY ACTIVITIES RECORD (BLANK PAGES)

ONE PAGE FOR EACH MONTH X 36 PAGES

MISCELLANEOUS

SUMMARY

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5.8.1 :LOG BOOK-1

ACADEMIC ACTIVITIES ATTENDED

Name:

Admission Year:

College:

Date	Type of activity - Specify Seminar, Journal club, Presentation, UG teaching	Particulars

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5.8.2 :LOG BOOK -2

ACADEMIC PRESENTATIONS MADE BY THE TRAINEE

Name :

Admission Year:

College:

Date	Topic	Type of activity - Specify Seminar, Journal club, Presentation, UG teaching

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5.8.3 :LOGBOOK-3

DIAGNOSTIC AND OPERATIVE PROCEDURES PERFORMED

Name

AdmissionYear:

College:

Date	Name	OP No.	Procedure	Category **O,** A, PA, PI

Key:

O- WASHED UP AND OBSERVED - INITIAL 6 MONTHS OF ADMISSION

A-ASSISTED A MORE SENIOR SURGEON -1 YEAR MDS

PA - PERFORMED PROCEDURE UNDER THE DIRECT SUPERVISION OF A SENIOR SURGEON - II YEAR MDS

PI-PERFORMED INDEPENDENTLY - III YEAR MDS

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REGULATIONS 2016

SYLLABUS

for Courses affiliated to the

Kerala University of Health Sciences

Thrissur 680596

Master of Dental Surgery (MDS)

Oral and Maxillofacial Surgery

Course Code: 243

(2016-17 Academic year onwards)

2016

2. COURSE CONTENT

2.1 Title of course:

MDS Oral and Maxillofacial Surgery

2.2 . Objectives of course

1. **Goals**

The goals of postgraduate training in various specialities are to train the BDS graduate who will:

- Practice respective specialty efficiently and effectively, backed by scientific knowledge and skill.
- Exercise empathy and a caring attitude and maintain high ethical standards.
- Continue to evince keen interest in continuing professional education in the specialty and allied specialties irrespective of whether in teaching orpractice.
- Willing to share the knowledge and skills with any learner, junior or a colleague.
- To develop the faculty for critical analysis and evaluation of various concepts and views, to adopt the most rational approach.

2. **Objectives**

The objective is to train a candidate so as to ensure higher competence in both general and special area of interest and prepare him/her for a career in teaching, research and specialty practice. A candidate must achieve a high degree of clinical proficiency in the subject matter and develop competence in research and its methodology as related to the field concerned.

The above objectives are to be achieved by the time the candidate completes the course. The objectives may be considered as under –

1. Knowledge (Cognitive Domain)
2. Skills (Psychomotor Domain)
3. Human values, ethical practice and communication abilities.

2.1. Knowledge

- Demonstrate understanding of basic sciences relevant to the specialty.
- Describe etiology, pathophysiology, principles of diagnosis and management of common problem within the specialty in adults and children.
- Identify social, economic, environmental and emotional determinants in a given case and take them into account for planning treatment.
- Recognize conditions that may be outside the area of specialty/competence and to refer them to an appropriate specialist.
- Update knowledge by self-study and by attending courses, conferences and seminars relevant to specialty.
- Undertake audit; use information technology and carry out research both basic and clinical with the aim of publishing or presenting the work at various scientific gatherings.

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2.2. Skills

- Take a proper clinical history, examine the patient, perform essential diagnostic procedures and order relevant tests and interpret them to come to a reasonable diagnosis about the condition.
- Acquire adequate skills and competence in performing various procedures as required in the specialty.

2.3. Human values, ethical practice and communication abilities

- Adopt ethical principles in all aspects of practice.
- Foster professional honesty and integrity.
- Deliver patient care, irrespective of social status, caste, creed, or religion of the patient.
- Develop communication skills, in particular skill to explain various options available in management and to obtain a true informed consent from the patient.
- Provide leadership and get the best out of his team in congenial working atmosphere.
- Apply high moral and ethical standards while carrying out human or animal research.
- Be humble and accept the limitations in his knowledge and skill and to ask for help from colleagues when needed.
- Respect patient's rights and privileges including patient's right to information and right to seek a second opinion.

2.3 Medium of instruction:

The medium of instruction for the course shall be English.

2.4 Course outline

This branch deals with the diagnosis and surgical and adjunctive treatment of diseases, injuries and defects of the human facial skeleton and associated oral and facial structures.

2.5 Duration

The course shall be of **three years** duration. All the candidates for the degree of MDS are required to pursue the recommended course for at least three academic years as full time candidates in an institution affiliated to and approved for Postgraduate studies by KUHS, observing the norms put forward by the DCI.

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i. There will be no reduction for the course duration for any of the students including service candidates, diploma holders and those who have done senior house surgeoncy or equivalent research experience.
ii. No student shall be permitted to complete the course by attending more than 6 continuous years.
iii. A candidate selected for admission in a Dental College is obliged to follow the curriculum, rules and regulations as approved by the Dental Council of India and the University. Curriculum, rules or regulations are subject to changes from time to time.

2.6 Subjects

The syllabus for the theory of Oral and Maxillofacial Surgery should cover the entire field of the subject and the following topics may be used as guidelines.

The concept of health care counseling shall be in corporated in all relevant areas.

The program outlines addresses both the knowledge needed in Oral and Maxillofacial Surgery and allied medical specialties in its scope. A minimum of three years of formal training through a graded system of education as specified will equip the trainee with skill and knowledge at its completion to be able to practice basic oral and Maxillofacial surgeon competently and have the ability to intelligently pursue further apprenticeship towards advance Maxillofacial surgery.

The topics are considered as under:-

- Basic sciences
- Oral and Maxillofacial surgery
- Allied specialties

PAPER – I APPLIED BASIC SCIENCES: Applied Anatomy, Physiology, Biochemistry, General and Oral Pathology, Microbiology and Pharmacology

Applied Basic Sciences:

A thorough knowledge both on theory and principles in general and in particular the basic medical subjects as relevant to the practice of maxillofacial surgery. It is desirable to have adequate knowledge in bio-statistics, Epidemiology, research methodology, nutrition and computers.

1.Anatomy

Development of face, paranasal sinuses and associated structures and their anomalies: surgical anatomy of scalp temple and face, anatomy and its applied aspects of triangles of neck, deep structures of neck, cranial facial bones and its surrounding soft tissues, cranial nerves tongue, semporal and infratemporal region, orbits and its contents, muscles of face and neck, paranasal sinuses, eyelids and nasal septum teeth gums and palate, salivary glands, pharynx, thyroid and parathyroid glands, larynx, trachea and esophagus, congenital abnormality of orofacial regions, General consideration of the structure and function of the brain and applied anatomy of intra cranial venous sinuses, cavernous sinus and superior sagittal sinus, Brief consideration of autonomous nervous system of head and neck, Functional anatomy of Mastication, Deglutition, speech, respiration and circulation. Histology of skin, oral mucosa, connective tissue, bone, cartilage, cellular elements of blood vessels, lymphatics, nerves, muscles, tongue tooth and its surrounding structures.

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2. Physiology

Nervous system-physiology of nerve conduction, pain pathway, sympathetic and parasympathetic nervous system, hypothalamus and mechanism of controlling body temperature; Blood-its composition hemostasis, blood dyscrasias and its management, hemorrhage and its control, blood grouping, cross matching, blood component therapy, complications of blood transfusion, blood substitutes, auto transfusion, cell savers; digestive system composition and functions of saliva mastication deglutition, digestion, assimilation, urine formation, normal and abnormal constituents; Respiration control of ventilation anoxia, asphyxia, artificial respiration, hypoxia - types and management; CVS - cardiac cycle, shock, heart sounds, blood pressure, hypertension; Endocrinology-metabolism of calcium; endocrinal activity and disorder relating to thyroid gland, parathyroid gland, adrenal gland, pituitary gland, pancreas and gonads; Nutrition-general principles balanced diet. Effect of dietary deficiency, protein energy malnutrition, Kwashiorkor, Marasmus, Nutritional assessment, metabolic responses to stress, need for nutritional support, entrails nutrition, roots of access to GI tract, Parenteral nutrition, Access to central veins, Nutritional support; Fluid and Electrolytic balance/Acid Base metabolism- the body fluid compartment, metabolism of water and electrolytes, factors maintaining hemostasis, causes and treatment of acidosis and alkalosis.

3.Biochemistry

General principles governing the various biological principles of the body, such as osmotic pressure, electrolytes, dissociation, oxidation, reduction etc; general composition of body, intermediary metabolism, carbohydrate, proteins, lipids, enzymes, vitamins, minerals and antimetabolites.

4.General Pathology

Inflammation - Acute and chronic inflammation, repair and regeneration, necrosis and gangrene, role of component system in acute inflammation, role of arachidonic acid and its metabolites in acute inflammation, growth factors in acute inflammation role of NSAIDS in inflammation, cellular changes in radiation injury and its manifestation; wound management - Wound healing factors influencing healing; properties if suture materials, appropriate uses of sutures; hemostasis - role of endothelium in thrombogenesis; arterial and venous thrombi, disseminated intravascular coagulation; Hypersensitivity; Shock and pulmonary failure: types of shock, diagnosis, resuscitation, pharmacological support, ARDS and its causes and prevention, ventilation and support, Neoplasms – classification of tumors, Carcinogens and Carcinogenesis, grading and staging of tumors, various laboratory investigation.

5.General microbiology

Immunity, Hepatitis B and its prophylaxis, Knowledge of organisms, commonly associated with diseases of oral cavity, culture and sensitivity tests, various staining techniques-Smears and cultures, urine analysis and culture.

6.Oral pathology and microbiology:

Developmental disturbances of oral and para oral structures, regressive changes of teeth, bacterial, viral, mycotic infection of oral cavity, dental caries, diseases of pulp and Periapical tissues, physical and chemical injuries of oral cavity, wide range of pathological lesions of hard and soft tissues of the orofacial regions like the cysts odontogenic infection, benign, malignant neoplasms, salivary gland diseases, maxillary sinus diseases, mucosal diseases, oral aspects of various systemic diseases, role of laboratory investigation in oral surgery.

7.Pharmacology and therapeutics:

Definition of terminology used, pharmacokinetics and pharmacodynamics, dosage and mode of administration of drugs, action and fate in the body, drug addiction, tolerance and hypersensitive reactions, drugs acting on CNS, general and local anesthetics, antibiotics and analgesics, antiseptics, antitubercular, sialagogues, hematinics, anti diabetic, Vitamins A, B-complex, C.D.E and K

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PAPER II – Minor Oral Surgery , Diseases and Defects of Orofacial region

Oral and Maxillofacial Surgery – Definition and scope.

1. General principles and surgical technique with special reference to plastic surgery.
    1.1. Sterilization and Disinfection.
    1.2. Scrub technique
    1.3. Incision
    1.4. Would healing
    1.5. Suture materials and techniques
    1.6. Dressings
2. Diagnosis in Oral and Maxillofacial Surgery.
    2.1. History taking
    2.2. Clinical examinations
    2.3. Radiographic examination
    2.4. Clinical laboratory diagnosis
    2.5. Biochemical profiles
    2.6. Special investigations
    2.7. Diagnostic aids – Biopsy, maxillofacial radiology
    2.8. Sialography, ultrasound, CT scan and MRI
    2.9. Recent advances in diagnostic aids with reference to oral and maxillofacial surgery including digital radiography, scintigraphy and PET scan
3. Local anesthesia
    3.1. Properties of local anesthetic drug
    3.2. Indications, contraindications
    3.3. Components of local anesthetic solution
    3.4. Mode of action of the anesthesia
    3.5. Complications and their management.
4. General anesthesia
    4.1. Properties of common drugs
    4.2. Preanaesthetic preparation of the patient and premedication.
    4.3. Short anaesthesia in Dental chair.
    4.4. Endotracheal anaesthesia

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4.5. Intravenous anaesthesia.

4.6. Complications and their management.

4.7. Hypotensive anesthesia

5. Medical emergencies in oral and maxillofacial surgery.
6. Importance of general conditions of the patient in relation to oral and maxillofacial surgery.
7. Fluid and electrolyte balance
8. Hematology – Blood, Bleeding disorders, coagulation
9. Hemorrhage and shock
10. Medically compromised patients –Management.
11. Recent antibiotics, analgesic and Anti-inflammatory drugs
12. Care of the hospitalized oral and maxillofacial surgery patient.
13. Biomaterials used in Oral and Maxillofacial Surgery.
14. Exodontia and impactions.
15. Acute and chronic infections of the Oral and Maxillofacial region.
    15.1. Odontogenic and non-odontogenic infections
    15.2. Soft tissue infections
    15.3. Facial space infections
    15.4. Hard tissue infections
    15.5. Osteomyelitis – classification, diagnosis and management specific infections of the oral and maxillofacial region management of infections
    15.6. Osteoradionecrosis and Osteonecrosis.
    15.7. Recent concepts in management.
16 Cysts of the Head and Neck region – Odontogenic and non-odontogenic,
    a) Etiology
    b) Pathology
    c) Clinical examination
    d) Diagnosis
    e) Investigations
    f) Management
    g) Recent advances
17 Tumours of the mouth and jaws
    a. Benign odontogenic and nonodontogenic tumours.
        i. Etiology

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ii. Pathology
iii. Diagnosis and Management
iv. Ameloblastoma
v. Etiology and Pathology
vi. Diagnosis and investigations
vii. Management
1. En block resections
2. Peripheral osteotomy
3. Hemimandibulectomy
4. Maxillectomy

18 Pre-malignant lesions of the oral cavity
a. Leukoplakia
b. Erythroplakia
c. Submucous fibrosis etc,

19 Malignant tumours of the oral cavity
a. Carcinomas and sarcomas
b. Etiology
c. Pathology
d. Diagnosis and investigations
e. Staging of tumours
f. Different modalities of treatment with special reference to surgical treatment.
i. Neck dissection
ii. Block dissection
g. Recent advances in management.

20 Disease of the maxillary sinus
a. Conditions involving the maxillary sinus
b. Relationship to dental diseases
c. Oro-antral fistula and foreign bodies in the maxillary sinus
d. Cysts of the maxillary sinus
e. Management of diseases of the maxillary sinus

21 Diseases of the Salivary Glands

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a. Surgical anatomy
b. Disease of the duct and gland proper
c. Sialadenitis
d. Sialolithiasis –sialolithotomy
e. Treatment planning & management
f. Benign and malignant tumours of salivary gland pathology
g. Investigation with special references to sialography
h. Management.

22 Disease of the Temporomandibular joint

a. Surgical anatomy
b. Clinical examination, diagnostic aids
c. Inflammatory conditions affecting TMJ
d. Developmental disorders / anomalies affecting TMJ.
e. Hypermobility and Hypomobility of TMJ
f. Tumors affecting TMJ
g. Internal derangement affecting TMJ
h. Management of disease of the Temporomandibular joint
i. Surgery of the temporomandibular joint.

23 Neurological disorders of the maxillofacial regions

a. Orofacial pain – concepts, pain pathways.
b. Neuralgias
c. Nerve palsies
d. Nerve injuries
e. Management

24 AIDS and Hepatitis in relation to oral and maxillofacial surgery

25 Systemic disease in relation to oral and maxillofacial surgery.

15.8. Endocrine disorders

15.9. Blood Dyscrasias

26 Auto immune diseases

27 Surgical Pathology

a. Wound healing – as related to soft tissues, bone fracture, Dental sockets, grafts etc.

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b. Infections – Gross infections, specific infection of the jaws and mouth. Fungal infections of interest to oral surgeons.
c. Actinomycosis, Granulomatous lesions of the oral cavity.
d. Specific, non specific granulomas, pyogenic, lethal midline granulomas etc., Osteomyelitis developing from dentoalveolar abscess, Odontolysis, teeth fracture.
e. Immune responses of the body, and its role in disease process, collagen diseases are related to the oral cavity. Recent concepts of immune reactions in transplants and oncology.
f. Developmental abnormalities, atrophy, hypertrophy, dysplasia hypoplasia and hyperplasias, hamartomas – Osseous, Odontogenic etc. Congenital and hereditary anomalies of jaws, atrophy of jaws, diseases of T.M.Joint.
g. Cyst and cyst like conditions – their pathogenesis, pathology and sequelae. Odontogenic cyst, follicular cyst, radicular cyst, dermoid cysts, median cysts, nasopalatine cysts, globule maxillary cysts, simple retention cysts, retention cysts of jaw
h. Pre – malignant conditions of the oral cavity, leukoplakia, erythroplakia of Quayrat, Bowens disease, Lichen planus etc. Grading of tumours – significance and prognosis in relation to therapy.
i. Neoplasms - Benign & malignant, modern concepts of oncogenesis, Diagnostic criteria and methods for benign neoplasm. General character, classification of pathology of benign tumours of jaws, salivary glands and other tissues of oral cavity.
j. Tumours of oral cavity including bony tumours, classifications, morphology and etiology of benign and malignant tumours.
k. Disease of the salivary glands and ducts.
l. Pathology of the Maxillary Sinus
m. Neurological disorders of the maxillofacial region

PAPER III – TRAUMATOLOGY AND MAXILLOFACIAL SURGERY

1. Maxillofacial trauma
   1.1. General examination
   1.2. Primary care and management of the patient
   1.3. Treatment planning
   1.4. Diagnostic aids – recent advances
2. Fractures of the Mandible

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2.1. Classification

2.2. Diagnosis and treatment planning

2.3. Different method of treatment

2.4. Recent advances in the management.

3. Fractures of the middle third of the facial skeleton

3.1. Classification, signs & symptoms

3.2. Diagnosis and treatment planning

3.3. Different method of treatment

3.4. Recent advances in the management.

4. Fractures of the upper third of the facial skeleton

4.1. Classification, signs & symptoms

4.2. Diagnosis and treatment planning

4.3. Different method of treatment

4.4. Recent advances in the management.

5. Surgical procedures in relation to endodontic therapy – Apicoectomy

6. Implantology

6.1. Endosseous, mucosal, subperiosteal, transosseos implants

6.2. Osseointegration, tissue integration and tissue regeneration

6.3. Intraoral, extraoral and extra cranial implants

6.4. Recent advances in implantology

7. Pre-prosthetic surgery

7.1. Principles and minor procedures

7.2. Grafting technique

7.3. Augmentation of alveolar ridge

7.4. Vestibuloplasty

8. Orthognathic surgery

8.1. Recognition and etiology of facial deformity

8.2. Assessment of the patient

8.3. Clinical examination

8.4. Diagnostic aids- Cephalometrics

8.5. Treatment planning

8.6. Surgical procedures

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8.6.1. Mandible

8.6.2. Midfacial skeleton

9. Plastic and Reconstructive Surgery – Congenital & Acquired Defects
   - 9.1. Surgical correction of Cleft lip & palate
   - 9.2. Correction of post – traumatic deformities
   - 9.3. Major flaps used in reconstruction – skin & mucosal
   - 9.4. Repair of bone defects
   - 9.5. Microvascular Surgery in orofacial reconstruction
10. Facial Aesthetic Surgical procedures
   - 10.1. Rhinoplasty
   - 10.2. Liposuction
   - 10.3. Face lifting procedures
   - 10.4. Laser cosmetic procedures
   - 10.5. Neuromodulators
   - 10.6. Dermal Fillers
11. Distraction osteogenesis:
   - 11.1. Concepts and techniques, Histiogenesis
12. Tissue engineering and stem cell therapy
13. Endoscopy in maxillofacial surgery
14. Computer assisted surgical planning, virtual osteotomies, 3D planning, virtual splints, 3D printing, Stereolithography.
15. Navigation surgery in maxillofacial region.
16. Basics of molecular biology of common oral lesions and its application in oral and maxillofacial surgery.

PAPER IV – RECENT ADVANCES IN ORAL AND MAXILLOFACIAL SURGERY

A 3 hour essay pertaining to Oral & Maxillofacial surgery, mentioned above with emphasis on recent advances

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Essential Skills to be learned by the student during the course of the study

Students shall be on full-time resident job in the department of OMFS and will manage/ help in manage cases of dento- alveolar surgery, trauma, tumors, cysts, facial deformities, oncology, infections and clefts. They are under guidance should also carry out all oral & maxiilofacial surgery programme throughout the three academic years, particularly in tutorials, seminars lectures and clinical discussions. Treatment planning and its execution is to be learned under the supervision of a postgraduate Guide.

Requirements for the students are as follows

Key for the chart below

O -Observer

A- Assisting a senior

PA- Performs procedure under the direct supervision of a senior specialist

PI- Performs independently

Procedure	Category	Year	Number
Injection I.M. and I.V.	PI	I,II	50,20
Minor suturing and removal of sutures	PI	I	N,A
Incision & drainage of an abscess	PI	I	10
Surgical extraction	PI	I	15
Impacted teeth	PA, PI	I, II	20,10
Pre prosthetic surgery-	PI		
a) corrective procedures	PI	I	5
b) ridge extension	PA	I,II	3
c) ridge reconstruction	A	II,III	3
OAF closure	PI, PA	I, II	3,3
Maxillary fractures	PA, A	II, III	3, 5
Orbito- zygomztic fractures	PA, A	II, III	3, 5
Cyst enucleation	Pl.PA	I, II	5,5
Mandibular fractures	Pl, PA	I,II	10, 10
Periapical surgery	Pl, PA	I	5

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Infection management	Pl, PA	I, II, III	N. A
Biopsy procedures	PI	I, II, III	N. A
Removal of salivary calculi	PA	II, III	3, 5
Benign tumors	Pl, PA	II, III	3, 3
Mid face fractures	PA, A	II, III	3,5
Implants	Pl, PA	II, III	5, 5
Tracheostomy	PA, A	II, III	2,2
Orthognathic surgery	PA, A	II, III	3
Harvesting bone & cartilage grafts a) Iliaccrest b) Rib c) Calvarial d) Fibula	 PA, O A, O A, O A, 0	II, III	 2, 3 2, 3 2, 3 2, 3
T.M. Joint surgery	PA, A	II, I,	1
Jaw resections	PA, A	III, II	3, 3
Onco surgery	A,0	III, III	3, 3
Micro vascular anastomosis	A,0	III	3, 5
Cleft lip & palate	PA,A	II, III	5, 10
Distraction osteogenesis	A,0	II, III	2, 3
Rhinoplasty	A,0	III	3, 5
Access osteotomies and base of skull surgeries	A,0	III	1, 1

The log book and record books are maintained about all work. Detailed history, investigations, treatment planning, preparation and assisting of all types of maxillofacial surgeries – major and cases – is to be recorded and to be presented in the examination.

SCHEME OF EXAMINATION

MDS Examination

1. Written examination

i. Number of papers –4

ii. Duration – 3 hrs each

iii. Maximum marks per paper –75

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iv. Distribution of marks per paper – the type of questions in these papers will be two long essay questions carrying 20 marks each and five short essay questions each carrying seven marks. There will be no options in the question papers I, II and III.

v. Title of the papers

Paper I – APPLIED BASIC SCIENCES: Applied Anatomy, Physiology, Biochemistry, General and Oral Pathology, Microbiology and Pharmacology

Paper II – Minor oral surgery, Diseases and Defects of orofacial region

Paper III- Traumatology and maxillofacial surgery.

Paper IV – Essay - All the above topics in Oral and Maxillofacial surgery with emphasis on recent advances.

1. Practical / Clinical examination (Total - 300marks)

i. Duration – Two days

ii. Time – 9 am to 4pm

Day I –

1. Minor Oral Surgery – impacted mandibular 3rd molar removal or any other surgical procedure under LA. 100marks
2. Two Short cases discussion (2 x20marks) 40marks
3. One long case – discussion 60marks

Day II-

1. Pedagogy presentation and discussion (10marks)
2. Radiographs, instruments – identification and discussion (10marks)

Viva Voce – (100 marks)

Each examiner will have to evaluate the candidates independently, (20 x 4 = 80 marks) and viva voce marks compiled.

a. Total number of hours

As per the instruction given by the DCI.

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b. Branches if any with definition

Oral and Maxillofacial Surgery

c. Teaching learning methods

Method of Training

The training of a postgraduate student shall be full time with graded responsibilities in the management and treatment of patients entrusted to his/her care. The participation of the students in all facets of educational process is essential. Every candidate should take part in seminars, group discussions, case demonstrations, clinics, journal review meetings, and clinical meetings. Every candidate shall be required to participate in the teaching and training programme of undergraduate students and interns. Training should include involvement in laboratory and experimental work, and research studies. Every Institution undertaking Post Graduate training programme shall set up an Academic cell or a Curriculum Committee, under the chairmanship of a Senior faculty member, which shall work out the details of the training programme in each speciality in consultation with other Department faculty staff and also coordinate and monitor the implementation of these training Programmes.

Based on the above guidelines for a structured training programme for postgraduate courses, the basic tenets of a successful postgraduate teaching programme, are detailed under the following heads.

- **Formal Lectures** by the faculty on varied subjects including general areas and systems. Both senior and junior faculty can do this. However, the number of these classes should be maintained at low levels to encourage self-learning.
- **Symposia / Seminars** form an integral part of PG learning. A monthly symposium will generate approximate 30-35 symposia / course. These symposia can include department faculty and HODs as chairpersons and maximum involvement of both students and faculty should be ensured.
- **Clinical Discussions** form the core of PG training and can be assigned to various clinical units on rotating basis. However other faculty could also actively participate in the discussion. The discussions must be 3-4/week. One suggestion is to score the performance of the candidate by a small panel of faculty and convey the scores to the candidate / PG at the end of the session.
- **Journal Club /Clinical Club** should be conducted at least once in a week in each postgraduate department. Journal clubs not only imparts new information but also trains the candidate to objectively assess and criticize various articles which come out and should be useful in ensuring evidence based dentistry.
- **Guest Lectures** can be integrated into the PG program at least once in a month. Even the retired faculty can be invited for delivering the lectures and will ensure importing of greater wisdom to the candidates.
- **Orientation Classes** for newcomers should also be incorporated. These classes can even be assigned to junior faculty/senior PGs.

- **Clinical posting.** Each PG student should work in the clinics on regular basis to acquire adequate professional skills and competency in managing various cases to be treated by a specialist.
- **Clinico Pathological Conferences** should be held once a year involving the faculties of Oral Medicine and Radiology, Oral Pathology and concerned clinical department. The student should be encouraged to present the clinical details, radiological and histo- pathological interpretations and participation in the discussions.
- **Rotation postings in other departments** should be worked out by each department in order to bring in more integration between the speciality and allied fields.
- **Periodical Quiz** can be both informative and entertaining and should be encouraged and planned.
- **Computer Training and Internet Applications** are now becoming a must for both faculty and students. These areas should be strengthened as a next step. There can be a sort of internet information club in the departments.
- **Conferences/CDEs** – All postgraduate students should be encouraged to attend conferences and CDEs. They should also be asked to present papers wherever appropriate and should be rewarded by assigning scores for them.
- **Publication of scientific papers** – It is desirable and advisable to have at least two publications in the State/National/International indexed dental journals.
- **Involvement in Teaching Activity** – PG students can be assigned the job of teaching the undergraduate students and these will definitely improve the teaching skills in the postgraduate students.

Examinations

Evaluation is a continuous process, which is based upon criteria developed by the concerned authorities with certain objectives to assess the performance of the learner. This also indirectly helps in the measurement of effectiveness and quality of the concerned MDS programme. Evaluation is achieved by two processes

1) Formative or internal assessment

2) Summative or university examinations.

Formative evaluation is done through a series of tests and examinations conducted periodically by the institution. Summative evaluation is done by the university through examination conducted at the end of the specified course.

A candidate registered for MDS course must clear the final examination within six years of the date of admission. The examinations should be so organized that this shall be used as the mechanism to confirm that the candidate has acquired appropriate knowledge, skill and competence at the end of the training that he/she can act as a specialist and/or a medical teacher as per expectation. University examination will be held regularly by KUHS in April-May/October-November every year.

A candidate who wishes to study for MDS in a second specialty should have to take the full course of 3 years in that specialty and appear for examinations.

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2.10 Content of each subject in each year

Present in clause 2.6

2.11 No: of hours per subject

Present in clause 2.6

2.12 Practical training

Present in clause 2.6

2.13 Records

Present in clause 2.20

2.14 Dissertation: As per Dissertation Regulations of KUHS

Every candidate pursuing MDS degree course is required to carry out work on a selected research project under the guidance of a recognized postgraduate teacher. The results of such a work shall be submitted in the form of a dissertation.

The dissertation is aimed to train a postgraduate student in research methods and techniques. It includes identification of a problem, formulation of a hypothesis, search and review of literature, getting acquainted with recent advances, designing of a research study, collection of data, critical analysis, and comparison of results and drawing conclusions.

Every candidate shall submit to the University in the prescribed format a synopsis containing particulars of proposed dissertation work after obtaining ethical clearance from the Institutional Ethical Committee **within six months from the date of commencement of the course or before the dates notified by the University**. The synopsis shall be sent only through the Principal of the institution.

Such synopsis will be reviewed and the dissertation topic will be registered by the university. No change in the dissertation topic or guide/coguide shall be made without prior approval of the University. The dissertation should not be just a repetition of a previously undertaken study but it should try to explore some new aspects. The dissertation should be written under the following headings:

i. Introduction
ii. Aims and Objectives of thestudy
iii. Review ofLiterature
iv. Methodology
v. Results
vi. Discussion
vii. Conclusion
viii. Summary
ix. References
x. Annexures

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The written text of dissertation shall be not less than 50 pages and shall not exceed 150 pages excluding references, tables, questionnaires, and other annexures. It should be neatly typed (font size 13-Times New Roman or font size 13-Cambria) in 1.5 line spacing on one side of the paper (A4 size, 8.27" x 11.69") and bound properly. Spiral binding should be avoided. (Refer KUHS website). The guide, co-guide if any, Head of the Department and the Head of the Institution shall certify the dissertation.

For uniformity, it was suggested that the colour of the hard bind of the dissertation for all branches of MDS course in the purview of KUHS shall be dark brown with letters of gold colour. The title, author, and year of study should also be imprinted or embossed on the spine of the book. **Three hard copies and one properly labeled soft copy in a CD (refer KUHS website) of the dissertation thus prepared shall be submitted to KUHS on the 29th month of commencement of the course / 31st Oct. of the 3rd academic year, whichever falls first.** Dissertation should preferably be sent to a minimum of three reviewers / examiners /assessors, of which two shall be from out side the state and one from the affiliated colleges o KUHS. If modifications are to be made as specified, three hard copies and one soft copy of the dissertation after corrections made by the candidate should be submitted with in a minimum of 30 days to the University. Consent for acceptance for evaluation of dissertation should be obtained from the reviewer/examiner/assessor before the dissertation are despatched. Proforma for evaluation of dissertation should be sent along with the copies of the dissertation to the reviewers appointed by the university. The proforma should contain all the assessment criteria with the clause – **Accepted/Accepted with modifications/Rejected** and reasons for rejection by the examiner. This proforma should be sent back to the University within two weeks / within the date specified after receipt of dissertation. The dissertation may be declared accepted if more than 50% of the reviewers (2 in the case of 3 reviewers) have accepted it. If modifications are to be made as specified, 3 hard copies and one soft copy of the dissertation after corrections made by the candidate should be submitted within 30 days to the University which may be sent back to the same examiner/s by the University for Acceptance after a fee has been levied from the candidate. If the dissertation has been rejected by more than 50% of the reviewers (2 in the case of 3 reviewers), the dissertation may be reviewed by an Expert Reviewing Committee comprising of not less than two subject experts, Dean (Research) of KUHS and Guide of the candidate provided the Guide requests for a review, after a fee has been levied from the candidate. If rejected by the Reviewing Committee, the candidate should take up a new topic and undergo all the procedures of submitting the synopsis, fees, IEC clearance, etc as prescribed by the University. The candidate who takes up the new topic can appear only for the subsequent examination.

Approval of dissertation work is an essential precondition for a candidate to appear in the University examination. Hall tickets for the university examination should be issued to the candidate only if the dissertation has been accepted.

A candidate whose dissertation has been accepted by the examiners and approved by the University, but who is declared to have failed at the final examination will be

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permitted to reappear at the subsequent MDS examination without having to prepare a dissertation.

Guide – The academic qualification and teaching experience required for recognition by the University as a guide for dissertation work is as laid down by the Dental Council of India / KUHS.

Co-guide – A co-guide may be included provided the work requires substantial contribution from the same department or a sister department or from another institution recognized for teaching/training by KUHS/DCI. The co-guide should fulfill the academic qualification and teaching experience required for recognition by the University as a co-guide for dissertation work.

Change of Guide – In the event of a registered guide leaving the college for any reason or in the event of death of guide, guide may be changed with prior permission from the University.

2.15 Speciality training if any

Present in clause 2.6

2.16 Project work to be done if any

Present in clause 2.6

2.17 Any other requirements [CME, Paper Publishing etc.]

Present in clause 2.6

2.18 Prescribed/recommended textbooks for each subject

<u>Applied Basic Sciences</u>

SUBJECT	NAME OF AUTHOR	NAME OF BOOK
Anatomy	BD Chaurasia	BD Chaurasia's Human Anatomy
	William, Peter L	Grays Anatomy
Oral Anatomy	Ash, Major M	Wheelers Dental Anatomy, Physiology and Occlosion
	Sicher, Harry, Du Brull , Llyod	Oral Anatomy
Oral Histology	Bhaskar B.N. Ed	Orbans Oral Histology and Embryology
	Avery, James K	Essentials of Oral Histology and

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		Embryology
Embryology	Sadler	Langmans Medical Embryology
	Inderbeer Singh	Human Embryology
Physiology	Guyton Arthur and John L Hall	Text Book of Medical Physiology
	Ganong, William F	Review of Medical Pysiology
Pharmacology	KD Tripathi	Essentials of Medical Pharmachology
	Hardman, Joel G	Goodman and Gillmans pharmacological basis of Therapeutics
Nutrition	Nizel	Nutrition in Preventive Dentistry: Science and Practice
General Pathology	Cotran, Ramzi S and Others	Robbins Pathologic Basis of Disease
	Harsh Mohan	Textbook of Pathology
Oral Pathology	Shaffer, William and Others	Textbook of Oral Pathology
	Neville, Brad W and Others	Oral and Maxillofacial Pathology
Microbiology	Ananthanarayan and Panicker	Textbook of Microbiology
	Lakshman S	Essential Microbiology for Dentistry
Biostatistics	Dr. Symalan	Statistics in Medicine
	Soben Peter	Essentials of Preventive and Community Dentistry
	Sunder Rao and Richard J.	Introduction to Biostatistics and Research Methods

Oral and Maxillofacial Surgery

- Maxillofacial injuries — L- Rowe &Williams
- Oral &Maxillofacial Trauma — Raymond J Fonseca
- Surgery of the Mouth & Jaws — JR.Moore
- Oral & Maxillofacial Surgery Vol I & II — Daniel M.Laskin
- Oral &Maxillofacial infections — Richard G.Topazion
- Dentofacial Deformities (Vol, II & III) — Brunce N., Epker, L C.Fish
- Text book of Oral & Maxillofacial Surgery — Neelima A.Malik
- Oral & Maxillofacial Surgery — Raymond J Fonseca
- Oral Cancers — McGregor
- Local Anesthesia — Malamed

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- Medical Emergencies — Malamed
- Plastic Surgery — Joseph J.McCarthy
- Surgical Orthodontics — Hell, Profitt,Moore
- TMJ Disorders — David A.Keith
- A Practical Guide to Hospital Dentistry — GeorgeVarghese
- A Practical Guide to the Management of Impacted Teeth — GeorgeVarghese
- Peterson's Principles of Oral & Maxillofacial Surgery Vol I & II — Edited byG.E.Ghali
- Oral and Maxillofacial Surgery Vol I and II — Peter WardBooth
- Craniofacial Distraction Osteogenesis — Samchukov
- Approaches to the Facial Skeleton — EdwardEllis
- OralCancer — JatinShah
- Medical Problems in Dentistry — Scully andCowson
- Anaesthesia — R.D.Miller
- Wylie and Churchill Davidson's A Practice of Anaesthesia — Healy,Knight,Lina
- Pain — Bonca
- Local flaps in Facial Reconstruction — ShahL.Baker
- Plastic Surgery (8vol) — JosephMcCarthy
- ENT (7vol) — Scott andBrown
- Surgical Correction of Facial Deformities — VargheseMani
- Head and Neck Surgery — Stell andMaran
- Salivary Gland Disorders — Carlson and Ord
- Contemporary Implant Dentistry — Carl E.Misch
- Oral and Maxillofacial Surgery Secrets — Abubaker
- Sedation- A Guide to Patient management — Malamed
- Infection Control & Management of Hazardous Material — Miller & CPalnik
- Clinical Review of Oral & Maxillofacial Surgery — Bagheni
- Principles of Dental Suturing: A Complete Guide to Surgical Closure — -Silverstein
- Craniomaxillofacial Reconstruction & Corrective Bone Surgery- Greenberg and Prin

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- Bell's Orofacial Pain — Oksan,Bell
- Osseointegration in Dentistry:An Overview — Worthington,Lang
- Surgical Correction of Dentofacial Deformities-New Concepts — William Bell
- Grab and Smith's Plastic Surgery — William C.Grab
- Endoscopic Facial Plastic Surgery — Gregory S.Keller
- Facial Paralysis: Rehabilitation

2.19 Reference books

As suggested by HOD

2.20 Journals

1 Journal of Oral & Maxillofacial Surgery
2 Journal of Craniofacial Surgery
3 British Journal of Oral & Maxillofacial Surgery
4 American Journal of Oral & Maxillofacial Surgery
5 Journal of Dental Research
6 Journal of American Dental Association.
7 Journal of Indian Dental Association.
8 Journal foams
9 Oral and Maxillofacial Surgery Clinics of North America
10 Journal of Dentistry
11 International DentalJournal
12 Dental Clinics of NorthAmerica
13 Triple 'O' (Jr. of Oral Path.., Oral medicine , Oral Surgery and Endodontics)
14 Quintessence International.

2.21 Logbook

- **Work Diary / Log Book**

Logbooks serve as a document of the trainee's work. The trainee shall maintain this Logbook of the special procedures/operations observed/assisted/performed by him/her during the training

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period right from the point of entry and its authenticity shall be assessed weekly by the concerned Post Graduate Teacher / Head of the Department. This shall be made available to the Board of Examiners for their perusal at the time of his / her appearing at the Final examination. The logbook should record clinical cases seen and presented, procedures and tests performed, seminars, journal club and other presentations. Logbook entries must be qualitative and not merely quantitative, focusing on learning points and recent advances in the area and must include short review of recent literature relevant to the entry. A work diary containing all the various treatment done by the candidate in the course of the study should also be maintained. The work diary shall be scrutinized and certified by both the guide/co guide and Head of the Department and presented in the University practical/clinical examination

28 EXAMINATIONS

3.1 Eligibility to appear for exams

Every candidate to become eligible to appear for the **MDS examination** shall fulfill the following requirements.

Attendance

Every candidate shall have fulfilled the attendance prescribed by the University during **each academic year** of the Postgraduate course. A candidate becomes eligible for writing the University examination only after the completion of 36 months from the date of commencement of the course. The candidates should have completed the training period before the commencement of examination.

Dissertation

Approval of the dissertation is mandatory requirement for the candidate to appear for the university examinations.

Library Dissertation

Submission of the library dissertation as per the regulations of DCI / KUHS is mandatory for a candidate to appear for the university examination.

Progress and Conduct

Every candidate shall have participated in seminars, journal review meetings, symposia, conferences, case presentations, clinics and didactic lectures during each year as designed by the concerned department.

Work Diary and Logbook

Every candidate shall maintain a work diary and logbook for recording his/her participation in the training programmes conducted by the department. The work diary and logbook shall be verified and certified by the Head of the department.

The certification of satisfactory progress by the Head of the Department and Head of the Institution shall be based on the checklist given in 5.1 to 5.8.

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- **Students should note that in case they do not complete the exercises and work allotted to them within the period prescribed, their course requirements will be considered unfulfilled.**
- **Clinical Records, Work Diaries and Logbooks should be maintained regularly and approved by the guide, duly certified by the Head of the Department.**

3.2 Schedule of Regular/Supplementary exams

The MDS examination shall be held at the end of the third academic year. The university shall conduct two examinations in a year at an interval of four to six months between two examinations. **Not more than two examinations shall be conducted in an academic year.**

3.3 Scheme of examination showing maximum marks and minimum marks

- MDS examination will consist of Written (Theory), Viva Voce, and Practical / Clinical examinations

Written Examination (Theory) : 300 Marks

Written examination shall consist of **four question papers**, each of three hours duration. Each paper shall carry 75 marks. The type of questions in the first three papers will be two long essay questions carrying 20 marks each and five short essay questions each carrying seven marks. **There will be no options in the questions in the first 3 papers. Fourth paper will be a single essay question paper which will carry an option and the candidate is to answer only one of the essays.** Questions on recent advances may be asked in any or all the papers. **The syllabus for the theory papers of the concerned specialty should cover the entire field of the subject. Though the topics assigned to the different papers are generally evaluated under designated papers, a strict division of the subject may not be possible and some overlapping of topics is inevitable. Students should be prepared to answer overlapping topics.** The theory examinations shall be held sufficiently earlier than the practical/clinical examinations so that the answer books can be assessed and evaluated before the start of the practical/clinical examination. The total marks for the theory examination shall be 300.

Practical Examination: 200 Marks

In case of practical examination, it should aim at assessing competence and skills of techniques and procedures. It should also aim at testing student's ability to make relevant and valid observations, interpretation and inference of laboratory or experimental or clinical work relating to his/her subject for undertaking independent work as a specialist. The actual format of clinical examinations in various specialities is given in Section III. The total mark for practical/clinical examinations shall be 200.

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Viva voce : 100 Marks

Viva voce examination shall aim at assessing depth of knowledge, logical reasoning, confidence and oral communication skills. The candidate may be given a topic for the pedagogy in the beginning of the clinical examination and asked to make a presentation on the topic for 8-10 minutes. The total marks shall be 100 of which 80 would be for the viva voce (20 marks/examiner) and 20 marks for the pedagogy.

3.4 Papers in each year

Paper-I - Applied Anatomy, Physiology and Pathology
Paper-II - Minor oral Surgery and Trauma
Paper-III -Maxillofacial Surgery and Oral Implantology
Paper-IV - Essay

3.5 Details of theory exams

Distribution of topics for each paper will be as follows :

Paper I **:** Applied Basic Sciences: Applied Anatomy, Physiology, Biochemistry, General and Oral Pathology and Microbiology and Pharmacology

Paper II **:** Minor Oral Surgery and Trauma

Paper III**:** Maxillofacial Surgery

Paper IV**:** Essay

3.6 Model Question Papers

MDS Branch IV – Oral and Maxillofacial Surgery

Paper- 1: Applied Anatomy, Physiology, Biochemistry, General and Oral Pathology, Microbiology and Pharmacology

Time 3 Hours Max. Marks75

Note: 1) Your answer should be specific to the questions

2) Draw net labeled diagrams whenever necessary

3) Answer all questions

Long essays **[2X20 = 40MARKS]**

1. Discuss the lymphatic drainage of head and neck and its role in the spread of oral malignancies.

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2.How does the hemostasis occur? Describe the various measures to control intra-operative and post-operative bleeding.

Short essays **[5X7=35MARKS]**

3.Principles of antibiotic therapy

4.Type I hypersensitivity reaction

5.Keratocystic odontogenic tumor

6.Cone Beam CT scan

7.Sialography

Paper- II– Minor Oral Surgery , Diseases and Defects of Oro facial region

Time 3 Hours Max. Marks75

Note: 1) Your answer should be specific to the questions

2) Draw neat labeled diagrams wherever necessary

3) Answer all questions

Long essays **[2X20 = 40marks]**

1. Classify odontogenic tumors. Discuss the options for the surgical management of ameloblastoma of maxilla.

2.Classify condylar fractures of mandible. Discuss the management of displaced condylar fractures.

Short essays **[5X7 = 35marks]**

3.Caldwell - Luc operation

4.Retrobulbar hemorrhage

5.Oroantral fistula

6.Diplopia

7.Frey's syndrome

Paper- III - TRAUMATOLOGY AND MAXILLOFACIAL SURGERY

Time 3 Hours Max. Marks75

Note: 1) Your answer should be specific to the questions

2) Draw neat labeled diagrams wherever necessary

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3) Answer all questions

Long essays **[2X 20 = 40marks]**

1.How will you manage a case of bilateral TMJ ankylosis in an 8 year old boy? Discuss in detail the associated complications.

2.Discuss the pre-surgical evaluation and management of mandibular prognathism

Short essays **[5x 7=35marks]**

3.Alveolar bone grafting

4.Cryosurgery

5.Arteriovenous malformation

6.Hemifacial microsomia

7.Maxillectomy

Paper- IV – Essay-Recent advances in Maxillofacial Surgery

Time 3 Hours Max. Marks75

Note: 1) Your answer should be specific to the questions

2) Draw neat labeled diagrams wherever necessary

3) Answer any ONE question

1. Craniofacial anomalies
2. Distraction osteogenesis

3.7 Internal assessment component

Not applicable.

3.8 Details of practical exams

Practical / Clinical examination (Total - 200marks)

iii. Duration –Two days
iv. Time –9 am to 4 pm

Day I –

1.Minor Oral Surgery – impacted mandibular 3rd molar removal or any other surgical procedure under LA. 100marks

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2.Two Short cases discussion (2 x20marks) 40marks

3.One long case–discussion 60marks

Day II-

4.Pedagogy presentation and discussion 20 marks

5.Radiographs, instruments – identification and discussion

Viva Voce – (100 marks)

All examiners will conduct viva-voce conjointly on candidate's comprehension, analytical approach, expression, interpretation of data and communication skills. It includes all components of course contents. (20 x 4 =80 marks)

3.9 Number of examiners needed (Internal & External) and their qualifications

There shall be at least four examiners in each branch of study. Out of four, two (50%) should be external examiners and two shall be internal examiners. The qualification and teaching experience for appointment as an examiner shall be as laid down by the DCI. The external examiners shall ordinarily be invited from another recognized University from outside the state. An external examiner may ordinarily be appointed for the same institute for not more than two years consecutively. Thereafter he may be reappointed after an interval of one year. The same set of examiners shall ordinarily be responsible for the practical and oral part of the examination.

The Head of the Department shall ordinarily be one of the examiners and the chairperson of the Board of Examinations; second internal examiner shall rotate after every two consecutive examinations if there are more than two postgraduate teachers in the department other than the Head of the department. No person who is not an active Postgraduate teacher in that subject can be appointed as Examiner. However in case of retired personnel, a teacher who satisfies the above conditions could be appointed as examiner up to one year after retirement.

For the MDS examination, if there are no two qualified internal examiners in an institute the second internal examiner can be from a neighbouring DCI and KUHS approved / recognized Dental College having PG course in the specific speciality. This examiner should be an active PG teacher in the same speciality with the qualifications and experience recommended for a teacher for postgraduate degree programme. The examination can also be conducted by one qualified internal examiner and three qualified external examiners if there is no qualified second internal examiner.

Reciprocal arrangement of Examiners should be discouraged, in that, the internal examiner in a subject should not accept external examinership of a college from which the external examiner is appointed in his subject in the same academic year.

3.10 Details of viva

Viva Voce : 100Marks

i. Viva-Voce examination :80 marks

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All examiners will conduct viva-voce conjointly on candidate's comprehension, analytical approach, expression, interpretation of data and communication skills. It includes all components of course contents. It includes presentation and discussion on dissertation also.

ii. Pedagogy and thesis presentation : 10 +10 = 20marks

4.INTERNSHIP

Not applicable for PG Courses

5.ANNEXURES

5.Check Lists for Monitoring: Log Book, Seminar Assessment etc.

CHECKLISTS and LOGBOOK

5.1Checklist 1

Model Checklist for Evaluation of Preclinical Exercises

Name of Student: Date:

Name of the Faculty-

in-charge:

Name of Exercise

Sl. No:	Items for observation during evaluation	Score
1	Quality of Exercise	
2	Ability to answer to questions	
3	Punctuality in submission of exercise	
4	TOTAL SCORE	

Performance	Score
Poor	0
Below Average	1
Average	2
Good	3
Very good	4

Signature of Faculty-in-charge

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5.2 :Checklist 2

Model Checklist for Evaluation of Journal Review / Seminar Presentation

Name of Student: Date:

Name of the Faculty/Observer:

Name of Journal / Seminar:

Sl. No:	Items for observation during evaluation	Score
1	Relevance of Topic	
2	Appropriate Cross references	
3	Completeness of Preparation	
4	Ability to respond to questions	
5	Effectiveness of Audio-visual aids used	
6	Time Scheduling	
7	Clarity of Presentation	
8	Overall performance	
9	TOTAL SCORE	

Performance	Score
Poor	0
Below Average	1
Average	2
Good	3
Very good	4

Signature of Faculty/Observer

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5.3:Checklist 3

Model Checklist for Evaluation of Clinical Case and Clinical Work

Name of Student: Date:

Sl. No:	Items for observation during evaluation	Score
1	History	
	Elicitation	
	Completeness	
2	Examination	
	General Examination	
	Extraoral examination	
	Intraoral examination	
3	Provisional Diagnosis	
4	Investigation	
	Complete and Relevant	
	Interpretation	
5	Diagnosis	
	Ability to defend diagnosis	
6	Differential Diagnosis	
	Ability to justify differential diagnosis	
7	Treatment Plan	
	Accuracy	
	Priority order	
8	Management	
9	Overall Observation	
	Chair side manners	
	Rapport with patient	
	Maintenance of Case Record	
	Quality of Clinical Work	
	Presentation of Completed Case	
10	TOTAL SCORE	

Performance	Score
Poor	0
Below Average	1
Average	2
Good	3
Very good	4

Name of the Faculty/Observer:

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5.4:Checklist4

Model Checklist for Evaluation of Library Dissertation Work

Name of Student: Date:

Name of the Faculty/Guide:

Sl. No:	Items for observation during evaluation	Score
1	Interest shown in selecting topic	
2	Relevance of Topic	
3	Preparation of Proforma	
4	Appropriate review	
5	Appropriate Cross references	
6	Periodic consultation with guide	
7	Completeness of Preparation	
8	Ability to respond to questions	
9	Quality of final output	
9	TOTAL SCORE	

Performance	Score
Poor	0
Below Average	1
Average	2
Good	3
Very good	4

Signature of Faculty/Guide

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5.5:Checklist5

Model Checklist for Evaluation of Dissertation Work

Name of Student: Date:

Name of the Faculty/Guide/Co-guide:

Sl. No:	Items for observation during evaluation	Score	Performance	Score
1	Interest shown in selecting topic		Poor	0
2	Relevance of Topic		Below Average	1
3	Preparation of Proforma		Average	2
4	Appropriate review		Good	3
5	Appropriate Cross references		Very good	4
6	Periodic consultation with guide/co- guide			
7	Depth of Analysis / Discuss			
8	Ability to respond to questions			
9	Department Presentation of findings			
10	Quality of final output			
	TOTAL SCORE			

Signature of Faculty/Guide/Co-guide

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5.6:CHECKLIST-6

CONTINUOUS EVALUATION OF DISSERTATION WORK BY GUIDE/CO-GUIDE

Name of the Trainee: Date

Name of the Faculty/Observer:

SI.No.	Items for observation during presentation	Poor 0	Below Average 1	Average 2	Good 3	Very Good 4
1.	Periodic consultation with guide / co- guide					
2.	Regular collection of case material					
3.	Depth of Analysis / Discussion					
4.	Department presentation of findings					
5.	Quality of final output					
6.	Others					
	Total score					

Signature of the guide / co-guide

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5.7:CHECKLIST -7

OVERALL ASSESSMENT SHEET

Name of theCollege: Date:

Name of Department:

Check List No	PARTICULARS	Name of trainee		
		First Year	Second Year	Third Year
1	Preclinical Exercises			
2.	Journal Review Presentation			
3.	Seminars			
4	Library dissertation			
5.	Clinical work			
6-	Clinical presentation			
7.	Teaching skill practice			
8.	Dissertation			
	TOTAL			

Signature of HOD **Signature of Principal**

The above overall assessment sheet used along with the logbook should form the basis for certifying satisfactory completion of course of study, in addition to the attendance requirement.

Key:

Mean score: Is the sum of all the scores of checklists 1 to 6

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5.8;LOGBOOK

DEPARTMENT OF ……..

MDS Programme

LOG BOOK OF

NAME…….

BIODATA OF THE CANDIDATE

EXPERIENCE BEFORE JOINING P.G. COURSE

DETAILS OF POSTING :

- **FIRST YEAR**
- **SECOND YEAR**
- **THIRD YEAR**

DETAILS OF LEAVE AVAILED

PRECLINICAL EXERCISES

LIBRARY DISSERTATION

RESEARCH WORK

PARTICIPATION IN CONFERENCES – CDE PROGRAMMES

DETAILS OF PARTICIPATION IN ACADEMIC PROGRAMME

SEMINARS /SYMPOSIA PRESENTED

JOURNAL CLUBS

TEACHING ASSIGNMENTS – UNDERGRADUATES / PARAMEDICAL.

SPECIAL DUTIES (IF ANY)

INTERNAL ASSESSMENT

DAILY ACTIVITIES RECORD (BLANK PAGES)

ONE PAGE FOR EACH MONTH X 36 PAGES

MISCELLANEOUS

SUMMARY

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5.8.1 :LOGBOOK-1

ACADEMIC ACTIVITIES ATTENDED

Name:

Admission Year: College:

Date	Type of activity - Specify Seminar, Journal club, Presentation, UG teaching	Particulars

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5.8.2 :LOG BOOK -2

ACADEMIC PRESENTATIONS MADE BY THE TRAINEE

Name :

Admission Year:

College:

Date	Topic	Type of activity - Specify Seminar, Journal club, Presentation, UG teaching

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5.8.3 :LOGBOOK-3

DIAGNOSTIC AND OPERATIVE PROCEDURES PERFORMED

Name Admission

Year: College:

Date	Name	OP No.	Procedure	Category **0,** A, PA, PI

Key:

O- WASHED UP AND OBSERVED - INITIAL 6 MONTHS OF ADMISSION

A-ASSISTED A MORE SENIOR SURGEON -1 YEAR MDS

PA - PERFORMED PROCEDURE UNDER THE DIRECT SUPERVISION OF A SENIOR SURGEON - II YEAR MDS

PI-PERFORMED INDEPENDENTLY - III YEAR MDS

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REGULATIONS 2016

SYLLABUS

for Courses affiliated to the

Kerala University of Health Sciences

Thrissur 680596

Master of Dental Surgery (MDS)

Conservative Dentistry and Endodontics

Course Code: 244

(2016-17 Academic year onwards)

2016

2 COURSE CONTENT

2.1 Title of course:

MDS Conservative Dentistry and Endodontics

2.2 . Objectives of course

1. Goals

The goals of postgraduate training in various specialties are to train the BDS graduate who will:

- Practice respective specialty efficiently and effectively, backed by scientific knowledge and skill.
- Exercise empathy and a caring attitude and maintain high ethical standards.
- Continue to evince keen interest in continuing professional education in the specialty and allied specialties irrespective of whether in teaching or practice.
- Willing to share the knowledge and skills with any learner, junior or a colleague.
- To develop the faculty for critical analysis and evaluation of various concepts and views, to adopt the most rational approach.

2. Objectives

The objective is to train a candidate so as to ensure higher competence in both general and special area of interest and prepare him for a career in teaching, research and specialty practice. A candidate must achieve a high degree of clinical proficiency in the subject matter and develop competence in research and its methodology as related to the field concerned.

The above objectives are to be achieved by the time the candidate completes the course. The objectives may be considered as under –

1. Knowledge (Cognitive Domain)
2. Skills (Psychomotor Domain)
3. Human values, ethical practice and communication abilities.

2.1. Knowledge

- Demonstrate understanding of basic sciences relevant to the specialty.
- Describe etiology, pathophysiology, principles of diagnosis and management of common problem within the specialty in adults and children.
- Identify social, economic, environmental and emotional determinants in a given case and take them into account for planning treatment.
- Recognize conditions that may be outside the area of specialty/competence and to refer them to an appropriate specialist.
- Update knowledge by self-study and by attending courses, conferences and seminars relevant to specialty.

- Undertake audit; use information technology and carryout research both basic and clinical with the aim of publishing or presenting the work at various scientific gatherings.

2.2. Skills

- Take a proper clinical history, examine the patient, perform essential diagnostic procedures and order relevant tests and interpret them to come to a reasonable diagnosis about the condition.
- Acquire adequate skills and competence in performing various procedures as required in the specialty.

2.3. Human values, ethical practice and communication abilities

- Adopt ethical principles in all aspects of practice.
- Foster professional honesty and integrity.
- Deliver patient care, irrespective of social status, caste, creed, or religion of the patient.
- Develop communication skills, in particular skill to explain various options available in management and to obtain a true informed consent from the patient.
- Provide leadership and get the best out of his team in congenial working atmosphere.
- Apply high moral and ethical standards while carrying out human or animal research.
- Be humble and accept the limitations in his knowledge and skill and to ask for help from colleagues when needed.
- Respect patient's rights and privileges including patient's right to information and right to seek a second opinion.

2.3 Medium of instruction:

The medium of instruction for the course shall be English.

2.4 Course outline

Conservative Dentistry and Endodontics deals with the etiology, diagnosis, prevention and treatment of the diseases and injuries of the hard dental tissues, pulp of the tooth and associated periapical conditions.

2.5 Duration

The course shall be of **three years'** duration. All the candidates for the degree of MDS are required to pursue the recommended course for at least three academic years as full time candidates in an institution affiliated to and approved for Postgraduate studies by KUHS, observing the norms put forward by the DCI.

i. There will be no reduction for the course duration for any of the students including service candidates, diploma holders and those who have done senior house surgeoncy or equivalent research experience.
ii. No student shall be permitted to complete the course by attending more than 6 continuous years.
iii. A candidate selected for admission in a Dental College is obliged to follow the curriculum, rules and regulations as approved by the Dental Council of India and the University. Curriculum, rules or regulations are subject to changes from time to time.

2.6 Subjects

Syllabus for MDS – Conservative Dentistry and Endodontics

The syllabus for the theory of Conservative Dentistry and Endodontics should cover the entire field of the subject and the following topics may be used as guidelines.

The concept of health care counseling shall be in corporated in all relevant areas.

Course Contents

Paper I : Applied Anatomy, Physiology, Pathology and Dental materials

1.DENTAL MATERIALS

1.1. Categories of Dental Materials

1.1.1.Direct and indirect materials

1.1.2.History of restorative materials

1.2.Structure of Matter

1.2.1Primary and secondary bonding

1.2.2.Crystalline and non crystalline

structure 1.2.3.Adhesion and bonding

1.3.Physical Properties

1.3.1.Abrasion resistance, viscosity, creep, flow, color

1.3.2.Tarnish and corrosion

1.4.Mechanical Properties

1.4.1.Stress and strain

1.4.2. Elastic deformation

1.4.3. Strength – different types

1.4.4. Toughness, brittleness, ductility and malleability, hardness

1.5. Solidification and Microstructure of Pure Metals and Alloys

1.5.1. Metallic bond

1.5.2. Solidification of metals. Grain size

1.5.3. Solid solutions

1.5.4. Equilibrium phase diagram

1.5.5. Coring, homogenization, dendrite formation

1.5.6. Eutectic alloys, peritectic alloys, solid state reactions

1.6. Polymer Science

1.6.1. Classification, chemistry, physical properties, types, copolymerization

1.7. Biocompatibility

1.7.1. Adverse effects of dentalmaterials

1.7.2. Measuring biocompatibility

1.7.3. Responses to specific materials

1.8. Impression Materials

1.8.1. Elastomeric impression materials–composition, chemistry, properties, manipulation

1.8.2. Hydrocolloids

1.8.3. Alginate, impression compound, impression pastes

1.9. Gypsum products

1.9.1. Types, composition, setting reaction, properties

1.10. Inlay Casting Wax

Types, composition, properties, flow, manipulation.

1.11. Casting Investments and Procedures

1.11.1. Types, composition, setting expansion

1.11.2. Die materials, sprue, casting ring liner, investing and casting procedures, defective casting

1.12. Burs, Abrasives, Dentifrices

1.12.1. Principles of cutting, types

1.13. Bonding and Restorative Resins

1.13.1. Acid etch technique, bonding agents, pit and fissure sealants

1.13.2. Composites. Classification, composition, properties, polymerization,

finishing and polishing

1.13.3.Posterior composites, Indirect composites and composite veneers

1.14.Dental Cements

1.14.1.Classification, composition, properties, uses

1.14.2.Liners and varnishes

1.15.Dental Amalgam

1.15.1.Composition, manufacture, properties, advantages and disadvantages

1.15.2.Steps in placement, mercury hygiene

1.16.Direct Filling Gold

1.16.1. Forms, removal surface impurities, compaction

1.17. Casting Alloys

1.17.1 Classification. Noble and base metal alloys.

1.18.Dental Ceramics

1.18.1. Classification, methods of strengthening, metal ceramics

1.18.2.Newer materials

1.19.Bio ceramic materials

1.19.1.Bioceramic cements

1.19.2.Bioceramic sealers

1.20. Emerging technologies

1.20.1. Nanotechnology
1.20.2. Bone-grafting materials
1.20.3. Stimulus - responsive "SMART" materials
1.20.4. Materials in Regenerative dentistry
1.20.5. Computer driven fabrication systems

2.Applied Anatomy of Head and Neck

2.1 Development of face, paranasal sinuses and the associated structures and their anomalies.

2.2 Cranial and facial bones.

2.3 TMJ anatomy and function

2.4 Arterial and venous drainage of head and neck

2.5 Muscles of face and neck including muscles of mastication and deglutition

2.6 Brief consideration of structures and function of brain.

2.7 Brief consideration of all cranial nerves and autonomic nervous system of head and neck.

2.8 Salivary glands – structure, function and clinical considerations.

2.9 Functional anatomy of mastication, deglutition and speech.

2.10 Detailed anatomy of permanent teeth, general consideration in physiology of permanent dentition, form, function, alignment, contact, occlusion.

2.11 Internal anatomy of permanent teeth and its significance

2.12 Applied histology, histology of skin, oral mucosa, connective tissue, bone cartilage, blood vessels, lymphatics, nerves, muscles, tongue.

3. Development of Teeth

3.1 Enamel-development and composition, physical characteristics, chemical properties, structure, Age changes- clinical structure, clinical considerations.

3.2 Dentin-development, physical and chemical properties, structure type of dentin, innervations, age and functional changes, clinical considerations.

3.3 Pulp-development, histological structures, innervations, functions, regressive changes, clinical considerations.

3.4 Cementum-composition, cementogenesis, structure, function, clinical consideration.

3.5 Periodontal ligament-development, structure, function and clinical consideration.

4.Applied Physiology

4.1 Mastication, deglutition, digestion and assimilation.

4.2 Fluid and electrolyte balance.

4.3 Blood composition, volume, function, blood groups, haemostasis, coagulation, blood transfusion.

4.4 Circulation, heart, pulse, blood pressure, shock.

4.5 Respiration, control, anoxia, hypoxia, asphyxia, artificial respiration.

4.6 Calcium and phosphorous metabolism.

4.7 Physiology of saliva - composition, function, clinical significance.

4.8 Clinical significance of vitamins, diet and nutrition – balanced diet.

4.9 Physiology of pain, sympathetic and Para sympathetic nervous system, pain pathways, physiology of pulpal pain, Odontogenic and non Odontogenic pain, pain disorders - typical and atypical.

4.10 Biochemical tests and their significance.

4.11 Enzymes, vitamin and minerals, metabolism of inorganic elements, detoxification in the body, anti metabolites, chemistry of blood lymph and urine.

5.Pathology

5.1 Inflammation, repair, degeneration, necrosis and gangrene.

5.2 Circulatory disturbances - ischemia, hyperemia, edema, thrombosis, embolism, infarction, allergy and hypersensitivity reaction.

5.3 Neoplasms - classifications of tumors, characteristics of benign and malignant tumors, spread tumors.

5.4 Blood dyscrasias

5.5 Developmental disturbances of oral and Para oral structures, dental caries, regressive changes of teeth, pulp, periapical pathology, pulp reaction to dental caries and dental procedures. Bacterial, viral, mycotic infections of the oral cavity.

5.6 Cysts and tumours of oral cavity

5.7 Wound and fracture healing.

6.Microbiology

6.1 Microbes of relevance to dentistry - streptococci, staphylococci, lactobacilli, cornyebacterium, actinomycetes, Clostridium, neisseria, vibrio, bacteriods, fusobacteria, spirochetes, mycobacterium, virus and fungi.

6.2 Pathways of pulpal infection, oral flora and microorganisms associated with endodontic

diseases, pathogenesis.

6.3 Host defense, bacterial virulence factors, healing,theory of focal infections.

6.4 Cross infection, infection control, infection control procedure, sterilization and disinfection.

6.5 Immunology - antigen antibody reaction, allergy, hypersensitivity and anaphylaxis, autoimmunity, grafts, viral hepatitis, HIV infections and AIDS

6.6 Identification and isolation of microorganisms from infected root canals. Culture medium and culturing technique Microscopy, Immunological Methods, Molecular biology techniques (PCR, DNA-DNA Hybridisation, Denaturing Gradient Gel Electrophoresis, Terminal-RFLP, DNA Microarrays, Fluorescence In Situ Hybridization)

6.7 Aerobic and anaerobic interpretation and antibiotic sensitivity test.

7. Pharmacology

7.1. General pharmacology

7.1.1.. Definitions - Pharmcokinetics with clinical applications, routes of administration including local drug delivery in endodontics

7.1.2.. Adverse drug reactions and drug interactions

7.2. Detailed pharmacology of

7.2.1.. Analgesics - opioid and nonopioid

7.2.2. Local anesthetics

7.2.3. Haematinics and coagulants, anticoagulants

7.2.4. VitD and calcium preparations

7.2.5. Antidiabetic drugs

7.2.6.. Steroids

7.2.7. Antibiotics

7.2.8. Antihypertensives

7.2.9. Immunosuppressive drugs and their effects on oral tissues

7.2.10. Antiepileptic drugs

7.2.11. Anti histamines

7.2.12. Anti sialagogues

7.2.13. Anti virals

7.3. Brief pharmacology, dental use and adverse effects of

7.3.1. General anesthetics

7.3.2. Antypsychotics

7.3.3. Antidepressants

7.3.4. Anxiolytic drugs

7.3.5. Sedatives

7.3.6. Antiepileptics

7.3.7. Antihypertensives

7.3.8. Antianginal drugs

7.3.9. Diuretics

7.3.10. Hormones

7.3.11. Pre-anesthetic medications

7.4. Drug therapy of

7.4.1. Emergencies

7.4.2. Seizures

7.4.3. Anaphylaxis

7.4.4. Bleeding

7.4.5. Shock

7.4.6. Diabetic ketoacidosis
7.4.7. Acute Addisonian crisis

7.5. Dental Pharmacology

7.5.1. Antiseptics and disinfectants
7.5.2.. Astringents
7.5.3.. Sialogogues
7.5.4. Disclosing agents
7.5.5. Antiplaque agents
7.5.6. Dentrifices
7.5.7. Artificial saliva

7.6. Fluoride pharmacology

7.7. Pharmacology of re - mineralizing agents

7.Biostatistics

7.1 Introduction, Basic concepts, Types of data. Compilation and presentation of data.

7.2 Health information systems - collection, compilation, presentation ofdata.

7.3 Measures of central tendency, measures of dispersion. Normal distribution.

7.4 Methods of sampling.

8.5. Estimation and hypothesis testing. Standard error, confidence interval, P value, Type I, II errors. Tests of significance - parametric (*z* test, t test, paired t test, analysis of variance) and non-parametric tests. (Mann Whitney U test, Kruskal-Wallis test, chi squared test)

8.6 Correlation and regression.

8.7 Developing a protocol. Epidemiologic(descriptive and analytic)study designs

8.8 Determining cause-effect relationship. Odds ratio and relative risk, prognosis.

8.9 Bias and confounding.

8.10 Sample size calculation and power.

8.11 Sensitivity and specificity.

9 Research Methodology

9.1. Essential features of a protocol for research in humans
9.2. Experimental and non-experimental study designs
9.3. Ethical considerations of research

Paper II : CONSERVATIVE DENTISTRY & AESTHETIC DENTISTRY

1. Introduction to Operative Dentistry

1.1. Definition, history

2. Dental Anatomy, Histology, Physiology, Occlusion

3. Cariology, Etiology, Prevention and Control

3.1. Definition, hypotheses, classification.

3.2. Plaque. Definition, pathophysiology, clinical characteristics, histopathology

3.3. Caries diagnosis, prevention, treatment, recent advances

3.4. Probiotics

4. Enamel and Dentin Adhesion

4.1. Challenges to dentin bonding

4.2. Hybridlayer

4.3. Dentin bonding agents

5. Tooth preparation

5.1. Terminology

5.2. Stages and steps in cavity preparation

5.3. Factors affecting tooth preparation

6. Instruments and Equipment for Tooth Preparation

6.1. Hand cutting instruments

6.2. Powered cutting equipment

6.3. Rotary cutting instruments – burs and abrasives

6.4. Hazards with cutting instruments

6.5. Alternative methods for tooth preparation

7. Infection Control

7.1. HIV and AIDS

7.2. Viral hepatitis

7.3. Aseptic techniques

7.4. Sterilization

7.5. Dental control unit water systems and hand piece asepsis

7.6. Infection control of impressions

8. Patient Examination, Diagnosis and Treatment Planning

8.1. Patient assessment

9. Initial steps prior to treatment

9.1. Patient and operator position

9.2. Pain control – newer techniques.

9.3. Isolation of operating field

10. Material Considerations in Composite Restorations

10.1. Properties

10.2. General considerations

10.3. Clinical technique

11. Class I to Class VI Composite Restorations

11.1.Tooth preparation, adhesive application, incremental placement and polymerization techniques

11.2.Matrix systems for composites, contact forming instruments, special placement methods, alternative polymerization techniques..

12. Tooth Colored Inlays and Onlays

12.1. preparation, impression, provisional restoration, cementation.

13. Other Conservative Esthetic Procedures

13.1. Aesthetics and golden proportion

13.2. Bleaching

13.3. Veneers and resin bonded splints

13.4. Conservative bridges

14. Advanced Aesthetic dentistry

14.1.Color and Shade selection and matching
14.2.Ultra conservative restorative dentistry
14.3.Clark's preparation for posterior composite restorations
14.4.Finishing and Polishing
14.5.Facial and Dental proportions
14.6.Emergence profiles
14.7.Smile design
14.8.Diastema closure
14.9.Direct and Porcelain veneers
14.10.Esthetic posts and cores
14.11.Perioesthetics
14.12.Orthoesthetics

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14.13.Endoesthetics

15.General Considerations for Amalgam restorations

16.Class I to Class VI Amalgam

16.1.Indications and contraindications

16.2.Advantages and disadvantages

16.3.Clinical technique

16.4.Restoration procedures

17.Complex Amalgam Restorations

17.1. preparation, pin retained restorstion

18.Cast Metal Restorations

18.1.Indications and Contraindications

18.2.Advantages and Disadvantages

18.3.Clinical Technique

18.4.Impression taking and fabrication

18.5.Cementation of the restoration

19.Direct Gold Restoration.

20.**Lasers and its applications.**

21.**Minimal Invasive Dentistry.**

22. Management of non carious lesions

23. Hypersensitivity theories, causes & management

24. CAD CAM & CAD CIM in restorative dentistry

25. Dental imaging and its application in restorative dentistry

26. Case documentation

26.1 Dental photography

27. Nanoparticles in Restorative dentistry

Paper III : ENDODONTICS

1. **Pulp development, structure & function**
   - 1.1. Pulp & dentin development, structure
   - 1.2. Dentin sensitivity and painful pulpitis
   - 1.3. Vital pulp therapy
2. **Pulpal Reaction to Dental Caries & Dental Procedures**
   - 2.1. Dental caries and sequelae
   - 2.2. Reaction of pulp to local anaesthetics, cavity and crown preparation

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2.3. Reaction of pulp to restorative materials

2.4. Periapical pathology

3. Microbiology and Immunology

3.1. Role of bacteria in pulpal and periradicular diseases

3.2. Pathways of pulpal and periapical infections

3.3. Flora of root canal and periradicular space

3.4. Endodontic biofilm

3.5. Identification and isolation of microorganisms from infected root canals. Culture medium and culturing technique, Microscopy, Immunological Methods, Molecular biology techniques.

3.6. Aerobic and anaerobic interpretation and antibiotic sensitivity test

4. Endodontic Diagnosis

4.1. History Taking

4.2. Examination and Testing

4.3. Clinical Classification of Pulpal and Periapical Diseases

4.4. Referred Pain

5. Instruments, Materials and Devices

5.1. Classification of instruments & materials

5.2. Instruments for root canal preparation

5.3. Physical and mechanical properties of hand instruments

5.4. Instruments for sealing the root canal

5.5. Auxiliary instruments & devices

5.6. Endosonics (Ultrasonic)

5.7. Greater taper instruments

5.8. Rotary endodontic system

5.9. Reciprocating endodontic systems

5.10. Endodontics materials - core and sealer materials

5.11. Lasers

5.12. Instruments in Endodontic micro surgery.

5.13. Magnification in endodontics.

5.14. Calcium Silicate based materials

6.Endodontic Emergencies

6.1. Diagnosis and management.

7.Non-odontogenic Facial Pain

8.Cases Selection and Treatment Planning

8.1. Evaluation of patient

8.2. Evaluation of the tooth

8.3. Treatment planning

9.Preparation for Treatment

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9.1.Preparation of patient

9.2.Preparation of operatory

9.3.Isolation of tooth

9.4. Pain control

10.Endodontic radiography

10.1.Intra oral radiography - routine, modified and special views

10.2.Digital Imaging

10.3.CBCT and Micro CT in endodontics

10.4. Ultrasound

11.Armamentarium and Sterilization

12.Tooth Morphology and Access Preparation

12.1.Tooth anatomy and its relation

12.2. Ideal access, guidelines, principles, special instruments, illumination and magnification

12.3.Access preparation for individual tooth, modifications.

12.4.Access preparation in calcified pulp chambers, complex restorations and ceramic crowns

13.Cleaning and Shaping the Root Canal System

13.1.Working length determination

13.2.Instrumentation methods

13.3.Instrumentation techniques

13.4.Engine driven, power driven, sonic and ultrasonic instruments

13.5.Smear layer in endodontics and its importance

13.6.Iatrogenic complications during cleaning and shaping canal

14.Root Canal Disinfection

14.1**.** Irrigants, techniques, devices, recent advances

14.2.Photodisinfection – principle, protocols

14.3. Intra canal medicaments

15.Obturation of the Root Canal System

15.1.Objectives of canal obturation

15.2.Techniques of obturation using different types of filling materials and sealers

15.3.Newer techniques of obturation

15.4.Healing of periapical tissue following obturation

16.Endodontic Traumatology

16.1.Traumatic injuries

16.2.Classification and treatment

16.3.Crown fractures - fracture of enamel, fracture involving dentin, fracture involving the pulp, pulp

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capping, pulpotomy, apexogenesis, follow up

16.4.Root fractures,diagnosis,types, management, healing of fracturedroots, follow up.

16.5 Treatment of fractured root not communicating with oral cavity, pulp obliteration, apexification.

16.6.Treatment of fractured root communicating with the oral cavity.

16.7.Minor fractures of alveolar –process

16.8.Subluxation, avulsion and replantation

16.9.Splinting of teeth

16.10.Prevention of traumatic injuries to teeth.

16.11.Cracks and Fractures of teeth

17. **Fracture mechanics**

17.1.Cracked and Fractured cusps
17.2.Cracked and split tooth
17.3.Vertical root fracture

18.Root Resorption

18.1.Definition,causes

18.2.External root resorption and management

18.3.Internal root resorption and management

18.4.Systemic causes of root resorption

19.Endodontic – Periodontic Interrelationship

19.1.Effect of pulpal disease on periodontium

19.2.Effect of endodontic treatment on periodontium

19.3.Effect of periodontal disease and its treatment on pulp

20.Endodontic – Orthodontic Interrelationship

20.1.Effect of orthodontic treatment on pulp and root morphology

20.2.Orthodontic extrusion of tooth for endodontic treatment

21.Surgical Endodontics

21.1.Definition, scope and prognosis

21.2.Contraindications and indication

21.3.Pre-surgical work up

21.4.Soft tissue management in endodontic surgery

21.5.Hard tissue management

21.6.Root resection and retro filling procedures

21.7.Post operative complication and management

21.8.Magnification and recent advances in endodontic surgery

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22.Bleaching of Vital and Pulpless teeth

22.1.Case selection for bleaching and contraindications

22.2.Causes of discoloration – extrinsic and intrinsic

22.3.Micro abrasion technique

22.4.In office bleaching of vital teeth

22.5.Bleaching pulpless teeth

22.6.Night guard vital bleaching

23.Pediatric & Geriatric Endodontics

24.Endodontic Failure and Treatment

24.1.Extent of Endodontic failures

24.2.Criteria for evaluating treatment results

24.3.Causes of endodontic failures

24.4.Retreatment of endodontic failures

24.5.The Apexum Procedure.

25.Endodontic implants

25.1.Material systems, techniques,types.

26.Pre and Post Endodontic Restorations

26.1. Materials, concepts, procedures.

26.2. Anatomical, biological and mechanical considerations for post endodontic restorations.

26.3. Post and cores- materials, types, fabrication.

27.Regenerative endodontics

27.1.Pulp Regeneration

27.2. Stem cells, Scaffolds and Growth factors

27.3. Revascularization

28. Nanoparticles in Endodontics

28.1. characteristics, use in endodontic disinfection- irrigants, medicaments, sealers, obturating materials, biofilm elimination, endodontic posts

29. Endodontic retreatment

29.1. rationale, nonsurgical and surgical retreatment

29.2. coronal disassembly,removal of obturation materials

29.3. separated instrument removal, post removal, locating missed canals

29.4. managing procedural errors, perforation repair.

30. Evaluation of endodontic treatments

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PAPER IV : ESSAY

A 3 hour essay from the syllabus on Conservative Dentistry and Endodontics with emphasis on recent advances.

PRE-CLINICAL EXERCISES

1. Exercises on Plaster Models

1.1. For Amalgam Restorations

1.1.1. Class II cavity, MO with distal pit and palatal extension on 16.

1.1.2. Class II MOD cavity with distal cusp capping on36.

1.1.3. Class II distal cavity on36.

1.1.4. Class II distal cavity, conventional, on36.

1.2. For Cast Restorations

1.2.1. Class II Box Preparation on 36.

1.2.2. Class II Modified Slice on36

1.2.3. Class II Modified flare on36

1.2.4. Onlay preparation with missing buccal cusps on36

1.3. For Acid – Etch Restorations

1.3.1. Class III typical cavity on11

1.3.2. Class III with lingual wall missing on 11

1.3.3. Class IV with both line angles missing on 11

2. Exercises On Typodont

2.1. Class II amalgam

2.1.1. Conservative MO on16

2.1.2. Conservative DO on46

2.1.3. Conservative MOD on36

2.1.4. Conventional MO on26

2.1.5. Conventional DO on36

2.1.6. Conventional MOD on46

2.2. Inlay cavity preparations

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2.2.1. MO on36

2.2.2. MO on46

2.2.3. DO on16

2.2.4. DO on26

2.2.5. DO on36

2.2.6. DO on46

2.2.7. DO on maxillary premolar

2.2.8. DO on mandibular premolar

2.2.9. MOD on36

2.2.10. MOD on46

2.3. Wax patterns

2.3.1. DO16

2.3.2. DO26

2.3.3. MO36

2.3.4. MO46

2.3.5. MOD36

2.3.6. MOD46

2.4. Inlay casting

2.4.1. Class II inlay on premolar

2.4.2. Class II inlay on maxillary molar

2.4.3. Class II inlay on mandibular molar

2.4.4. MOD on mandibular molar

2.5. Onlay on molars

2.5.1. Onlay preparation

2.5.1.1. Maxillary first molar

2.5.1.2. Mandibular first molar

2.5.2. Onlay to be processed

2.5.2.1. Mandibular first molar

2.6. Full crowns

2.6.1. Anterior teeth

2.6.1.1. Maxillary central incisor

2.6.1.2. Maxillary lateral incisor

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2.6.1.3. Maxillary canine

2.6.1.4. Mandibular lateral incisor

2.6.1.5. Mandibular canine

2.6.1.2. Posterior teeth

2.6.1.2.1. Maxillary first premolar

2.6.1.2.2. Maxillary second premolar

2.6.1.2.3. Maxillary first molar

2.6.1.2.4. Mandibular first premolar

2.6.1.2.5. Mandibular first molar

2.6.1.3. Crowns to be processed

2.6.1.3.1. Maxillary central incisor

2.6.1.3.2. Maxillary lateral incisor

2.6.1.3.3. Maxillary first molar

2.6.1.3.4. Mandibular first molar

2.7. 7/8Crown

2.7.1. 7/8 crown preparation

2.7.1.1. Maxillary first molar

2.7.1.2. Mandibular first molar

2.7.2. 7/8 crown to be processed

2.7.2.1. Maxillary first molar

2.8. 3/4 crown on premolars

2.8.1. 3/4 crown preparation

2.8.1.1. Maxillary canine

2.8.1.2. Maxillary first premolar

2.8.2. 3/4 crown to be processed

2.8.2.1. Maxillary first premolar

3. Full tooth wax carving – all permanent teeth

4. Exercises on natural teeth

4.1. Inlay preparation.

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4.1.1. Maxillary molar – Mesio- Occlusal

4.1.2. Maxillary molar – Disto -Occlusal

4.1.3. Maxillary molar – Mesio- Occluso- Distal

4.1.4. Mandibular Molar – Mesio- Occlusal

4.1.5. Mandibular Molar – Disto- Occlusal

4.1.6. Mandibular Molar – Mesio- Occluso – Distal

4.1.7. Maxillary Premolar – Mesio - Occlusal

4.1.8. Mandibular Premolar _Disto-Occlusal

4.1.2. Wax Pattern

4.1.2.1. Maxillary molar – Mesio- occlusal

4.1.2.2. Mandibular Molar – Mesio -Occluso –Distal

4.1.3. Casting

4.1.3.1. Class II inlay on maxillary molar

4.1.3.2. Class II inlay on mandibular molar

4.2. Amalgam preparation

4.2.1. Class II conventional preparation & amalgam restoration on maxillary molar

4.2.2. Class II conservative preparation & amalgam restoration on maxillary molar

4.2.3. Class II conventional preparation & amalgam restoration on mandibular molar

4.2.4. Class II conservative preparation & amalgam restoration on mandibular molar

4.3. Pin retained amalgam restoration

4.3.1. Maxillary molar

4.3.2. Mandibular molar

4.4. Post and Core

4.4.1. Anterior teeth

4.4.1.1. Direct post and core build up (Resin/Fiber Post & aesthetic core)

4.4.1.1.1 Maxillary centrals –(11 & 21)- 2

4.4.1.1.2. Maxillary lateral-1

4.4.1.1.3. Maxillary canine –1

4.4.1.1.4. Mandibular lateral –1

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4.4.1.2. Indirect post and core – wax pattern

4.4.1.2.1. Maxillary central

4.4.1.2.2. Maxillary lateral

4.4.1.2.3. Maxillary canine

4.4.1.2.4. Mandibular lateral

4.4.1.2.5. Mandibular canine

4.4.1.3. Posterior teeth – Indirect post & core – wax pattern

4.4.1.3.1. Maxillary first premolar

4.4.1.3.2. Maxillary first molar

4.4.1.3.3. Maxillary second molar

4.4.1.3.4. Mandibular first molar

4.4.1.3.5. Mandibular second molar

4.4.1.4. Casting

4.4.1.4.1. Anterior post and core

4.4.1.4.1. Maxillary central

4.4.1.4.2. Maxillary lateral

4.4.1.4.3. Maxillary canine

4.1.4.4. Mandibular canine

4.4.1.5. Posterior post and core

4.4.1.5.1. Maxillary premolar

4.4.1.5.2. Mandibular molar

4.5. Onlay on molars

4.5.1. Onlay preparation

4. 5.1.1.Maxillary first molar

4.5.1.2. Mandibular first molar

4.5.1.3. Mandibular second molar

4.5.1.2. Onlay casting

4.5.1.2.1. Onlay prepared on Mandibular first molar

4.6. Crown preparation

4.6.1. Full crown preparation

4.6.1.1. Maxillary central incisor

4.6.1.2. Maxillary lateral incisor

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4.6.1.3. Maxillary canine

4.6.1.4. Maxillary premolar

4.6.1.5. Maxillary molar

4.6.1.6. Mandibular central incisor

4.6.1.7. Mandibular lateral incisor

4.6.1.8. Mandibular canine

4.6.1.9. Mandibular premolar

4.6.1.10. Mandibular molar

4.6.2. Full crowns to be processed (Casting)

4.6.2.1. Maxillary central incisor

4.6.2.2. Maxillary lateral incisor

4.6.2.3. Maxillary canine

4.6.2.4. Maxillary molar

4.6.2.5. Mandibular molar

4.7. Veneers on anterior teeth (Indirect method)

4.7.1. Full veneer on maxillary central incisor (window design)

4.7.2. Full veneer with incisal lapping on maxillary central incisor (incisal lapdesign)

4.8. Composite Inlay

4.8.1. Class II composite inlay preparation

4.8.1.1. Class II DO on maxillary first premolar

4.8.1.2. Class II MO on maxillary first molar

4.8.1.3. Class II MO on mandibular first molar

4.8.1.2. Composite inlay to be processed

4.8.1.2.1. Class II MO on mandibular first molar

4.9. Midline diastema closure of maxillary incisors

4.10. Composite restorations

4.10.1. Class I

4.10.1.1. Conventional preparation (Box preparation)on maxillary first molar

4.10.1.2. Modified preparation on mandibular premolar

4.10.1.3. Extensive modified preparation on maxillary first molar (splint design)

4.10.2.1. Class II

4.10.2.1. Conventional preparation on mandibular molar

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4.10.2.2. Beveled conventional preparation on maxillary molar

4.10.2.3. Modified preparation on maxillary premolar

4.10.2.4. Extensive modified preparation on mandibular first molar (wraparound design)

4.11. Endocrown preparation on mandibular molar –(1)

4.12. Bridge for missing upper second premolar -(1)

5.Endodontic Preclinical Exercises on Extracted Teeth

5. Sectioning Of Extracted Teeth

5.1Horizontal Section Showing Pulp Chamber

5.1.1Maxillary Central Incisor

5.1.2.Maxillary Canine

5.1.3.Maxillary First Premolar

5.1.4.Maxillary Second Premolar

5.1.5.Maxillary First Molar

5.1.6Mandibular Central Incisor

5.1.7.Mandibular Canine

5.1.8.Mand First Premolar

5.1.9.Mandibular Second premolar.

5.1.10.Mandibular First Molar

5.2. Vertical Section Showing Pulp Chamber And Root Canals

5.2.1.Maxillary Central Incisor

5.2.2. Maxillary Canine

5.2.3.Maxillary First Premolar

5.2.4.Maxillary Second Premolar

5.2.5.Maxillary First Molar

5.2.6.Mandibular Central Incisor

5.2.7.Mandibular Canine

5.2.8.Mandibular First Premolar

5.2.9. Mandibular Second Premolar

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5.2.10. Mandibular First Molar

5.3. Access Cavity Preparations(under magnifying loupe)

5.3.1. Maxillary Central Incisor

5.3.2. Maxillary Canine

5.3.3. Maxillary First Premolar

5.3.4. Maxillary Second Premolar

5.3.5. Maxillary First Molar

5.3.6. Mandibular Central Incisor

5.3.7. Mandibular Canine

5.3.8. Mandibular First Premolar

5.3.9. Mandibular Second Premolar

5.3.10. Mandibular First Molar

5.4. Endodontics Exercises On Extracted Teeth (under magnifying loupe)

5.4.1. Stepback preparation and lateral condensation technique on 16 and 36**.**

5.4.2. Preparation using protaper and 4% taper instruments, & lateral condensation.

5.4.3. 5.4.3. Crown down preparation and vertical condensation on 11 with thermoplasticized guttapercha.

5.4.4. Section obturated teeth and observe under operating microscope.

CLINICAL REQUIREMENTS:

1. *First Year:*

1.1. Anterior aesthetic restorations-GIC, Composite - 30cases

1.2. Anterior Endodontics- - 30cases

1.3. Amalgam fillings - Pin retained and bonded amalgams - 10cases

1.4. Management of deep caries lesion-Pulpotomy, Pulp Capping - 20cases

1.5. Apexification and Apexogenesis - 5cases

2. *Second Year:*

2.1. Cast restorations-inlays and Onlays - 15cases

2.2. Direct posterior tooth colored restorations - 20cases

2.3. Bleaching-Vital and nonvital - 10 cases each

2.4. Post and core restorations-Prefabricated

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[light transmitting and metal] -10 cases each

2.5. Core build up and full crown - 15cases

2.6. Anterior and posterior endodontics - 50cases

2.7. Rotation Posting of 15 days each in

2.7.1.Periodontics

2.7.2.Prosthodontics

2.7.3.Oral surgery

3. *Third Year:*

3.1. Aesthetic and functional rehabilitation of complex conditions [such as amelogenesis imperfecta] - 5cases

3.2. Complex cases with multi disciplinary approach- Endo-perio/Endo-ortho/Endo-prostho cases - 10cases

3.3. Surgical Endodontics- Apicoectomy -10cases

3.4. Post and core fabrication – custom made and cast-anterior -15cases

-posterior -5cases

3.5. Veneer -5cases

3.6. Retreatment and fractured instrument removal -5cases

3.7. Rehabilitation in cases of endodontic traumatology -15cases

3.8. Posterior endodontics – difficult cases management -25cases

3.9. Revascularization and regenerative endodontic treatment -5cases

Library Dissertation: Should be a comprehensive review of the selected topic which should be finalized and approved by the end of the first six months and the same to be submitted at the end of the first year . It should be approved by the guide and certified by the Head of the Department.

Conferences and Publication of Scientific Papers: During the MDS course the student should attend national conferences and attempts should be made to present at least three scientific papers and publish at least two scientific articles in a journal relevant to the speciality.

Minimum Requirements:

1. Seminars - 15

2. Journal Clubs -15

3. Teaching training programme for under graduate students – lecture and clinical – 10

4. Scientific paper publication in a journal related to the speciality – 2articles

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5. Scientific paper presentation in conference –State/National/Speciality– 3

6. Should attend at least one workshop in dental materials research

Scheme of Examination

Third Year M.D.S. Examination

1. **Written Examination**

i. Number of papers - 4

ii. Duration - 3 hours each

iii. Maximum marks per paper - 75

iv. Distribution of marks per paper- First three papers will be having two long essay questions carrying 20 marks each and five short essay questions each carrying seven marks. There will be no choice in the questions for any of the first three papers. Fourth paper will be a single essay question paper where there will be an option and the candidate should answer only one essay.

v. Title of the papers

   a. **Paper I –Applied Anatomy, Physiology, Pathology and Dental materials**
   b. **Paper II–Conservative dentistry & Aesthetic Dentistry**
   c. **Paper III –Endodontics**
   d. **Paper IV – Essay on Recent advances on Conservative Dentistry and Endodontics**

2. **Practical/Clinical and Viva Voce Examination**

I. Duration - Two Days

II. Time - 9 am to 4pm

Clinical examination –Three Exercises - 300marks

The Practical / Clinical examination will include Conservative Dentistry, Endodontics and Dental Materials.

Day 1

Forenoon

- Exercise I – Tooth preparation for cast post and core and inlay wax impression

- Exercise II- Rubber dam placement, access cavity preparation, pulp extripation, working length determination, biomechanical preparation and master cone radiograph – on molar tooth.
- Evaluation of preclinical exercises, clinical records and other academic activities.

After noon

- Exercise III – Posterior Class II Composite Restoration.

Day II

Forenoon

- Gingival retraction and Impression taking after cementation of post and core.

After noon

- Viva voce (including presentation of dissertation /pedagogy).

Marks 100

MARK DISTRIBUTION OF PRACTICAL EXAMINATION & VIVA- VOCE

Practical /Clinical Examination- 200Marks

1. Evaluation of preclinical exercises, clinical records, other academic activities and overall performance during the course **25marks**
2. **Clinical procedures**

2.1. Cast Post and Core 50marks

a. Case presentation and treatment plan 10
b. Evaluation of post space preparation 10
c. Coronal preparation 10
d. Wax pattern 10
e. Gingival retraction and impression 10

2.2. Molar RCT 75**marks**

a. Case presentation and treatment plan 10
b. Isolation and fluid control 10
c. Access cavity preparation 20
d. Working length determination 10
e. Pulp space preparation 15
f. Master Cone Selection 10

2.3. Posterior Class II Composite restoration 50marks

a. Case presentation and treatment planning 10

b. Isolation and fluid control 10

c. Tooth preparation 10

d. Matricing and wedging 10

e. Restoration 10

Viva Voce - 100Marks

i. Viva-Voce examination: 80

All examiners will conduct viva-voce conjointly on candidate's comprehension, analytical approach, expression, interpretation of data and communication skills.

ii. Dissertation presentation/Pedagogy 20

2.7 Total number of hours

As per the regulations of the DCI.

2.8 Branches if any with definition

Conservative Dentistry and Endodontics

2.9 Teaching learning methods

Method of Training

The training of a postgraduate student shall be full time but graded responsibilities in the management and treatment of patients entrusted to his/her care. The participation of the students in all facets of educational process is essential. Every candidate should take part in seminars, group discussions, case demonstrations, clinics, journal review meetings, and clinical meetings. Every candidate shall be required to participate in the teaching and training programme of undergraduate students and interns. Training should include involvement in laboratory and experimental work, and research studies. Every Institution undertaking Post Graduate training programme shall set up an Academic cell or a Curriculum Committee, under the chairmanship of a Senior faculty member, which shall work out the details of the training programme in each speciality in consultation with other Department faculty staff and also coordinate and monitor the implementation of these training Programmes.

Based on the above guidelines for a structured training programme for postgraduate courses, the basic tenets of a successful postgraduate teaching programme, are detailed under the following heads.

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- **Formal Lectures** by the faculty on varied subjects including general areas and systems. Both senior and junior faculty can do this. However, the number of these classes should be maintained of low levels to encourage self-learning.
- **Symposia / Seminars** form an integral part of PG learning. A monthly symposium will generate approximate 30-35 symposia / course. These symposia can include department faculty and HODs as chairpersons and maximum involvement of both students and faculty should be ensured.
- **Clinical Discussions** form the core of PG training and can be assigned to various clinical units on rotating basis. However other faculty could also actively participate in the discussion. The discussions must be 3-4/week. One suggestion is to score the performance of the candidate by a small panel of faculty and convey the scores to the candidate / PG at the end of the session.
- **Journal Club /Clinical Club** should be conducted at least once in a week in each postgraduate department. Journal clubs not only imparts new information but also trains the candidate to objectively assess and criticize various articles which come out and should be useful in ensuring evidence based dentistry.
- **Guest Lectures** can be integrated into the PG program at least once in a month. Even the retired faculty can be invited for delivering the lectures and will ensure importing of greater wisdom to the candidates.
- **Orientation Classes** for newcomers should also be incorporated. These classes can even be assigned to junior faculty/senior PGs.
- **Clinical posting.** Each PG student should work in the clinics on regular basis to acquire adequate professional skills and competency in managing various cases to be treated by a specialist.
- **Clinico Pathological Conferences** should be held once a year involving the faculties of Oral Medicine and Radiology, Oral Pathology and concerned clinical department. The student should be encouraged to present the clinical details, radiological and histo- pathological interpretations and participation in the discussions.
- **Rotation postings in other departments** should be worked out by each department in order to bring in more integration between the speciality and allied fields.
- **Periodical Quiz** can be both informative and entertaining and should be encouraged and planned.
- **Computer Training and Internet Applications** are now becoming a must for both faculty and students. These areas should be strengthened as a next step. There can be a sort of internet information club in the departments.
- **Conferences/CDEs** – All postgraduate students should be encouraged to attend conferences and CDEs. They should also be asked to present papers wherever appropriate and should be rewarded by assigning scores for them.
- **Publication of scientific papers** – It is desirable and advisable to have at least two publications in the State/National/International indexed dental journals.
- **Involvement in Teaching Activity** – PG students can be assigned the job of teaching the undergraduate students and these will definitely improve the teaching skills in the postgraduate students.

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Evaluation is a continuous process, which is based upon criteria developed by the concerned authorities with certain objectives to assess the performance of the learner. This also indirectly helps in the measurement of effectiveness and quality of the concerned MDS programme. Evaluation is achieved by two processes

1) Formative or internal assessment

2) Summative or university examinations.

Formative evaluation is done through a series of tests and examinations conducted periodically by the institution. Summative evaluation is done by the university through examination conducted at the end of the specified course.

A candidate registered for MDS course must clear the final examination within six years of the date of admission. The examinations should be so organized that this shall be used as the mechanism to confirm that the candidate has acquired appropriate knowledge, skill and competence at the end of the training that he/she can act as a specialist and/or a medical teacher as per expectation. University examination will be held regularly by KUHS in April-May/October-November every year.

A candidate who wishes to study for MDS in a second specialty should have to take the full course of 3 years in that specialty and appear for examinations.

2.10 Content of each subject in each year

Present in clause 2.6

2.11 No: of hours per subject

Present in clause 2.6

2.12 Practical training

Present in clause 2.6

2.13 Records

Present in clause 2.20

2.14 Dissertation: As per Dissertation Regulations of KUHS

Every candidate pursuing MDS degree course is required to carry out work on a selected research project under the guidance of a recognized postgraduate teacher. The results of such a work shall be submitted in the form of a dissertation.

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The dissertation is aimed to train a postgraduate student in research methods and techniques. It includes identification of a problem, formulation of a hypothesis, search and review of literature, getting acquainted with recent advances, designing of a research study, collection of data, critical analysis, and comparison of results and drawing conclusions.

Every candidate shall submit to the University in the prescribed format a synopsis containing particulars of proposed dissertation work after obtaining ethical clearance from the Institutional Ethical Committee **within six months from the date of commencement of the course or before the dates notified by the University**. The synopsis shall be sent only through the Principal of the institution.

Such synopsis will be reviewed and the dissertation topic will be registered by the university. No change in the dissertation topic or guide/coguide shall be made without prior approval of the University. The dissertation should not be just a repetition of a previously undertaken study but it should try to explore some new aspects. The dissertation should be written under the following headings:

i. Introduction
ii. Aims and Objectives of the study
iii. Review of Literature
iv. Methodology
v. Results
vi. Discussion
vii. Conclusion
viii. Summary
ix. References
x. Annexures

The written text of dissertation shall be not less than 50 pages and shall not exceed 150 pages excluding references, tables, questionnaires, and other annexures. It should be neatly typed (font size 13-Times New Roman or font size 13-Cambria) in 1.5 line spacing on one side of the paper (A4 size, 8.27" x 11.69") and bound properly. Spiral binding should be avoided. (Refer KUHS website). The guide, co-guide if any, Head of the Department and the Head of the Institution shall certify the dissertation.

For uniformity, it was suggested that the colour of the hard bind of the dissertation for all branches of MDS course in the purview of KUHS shall be dark brown with letters of gold colour. The title, author, and year of study should also be imprinted or embossed on the spine of the book. **Three hard copies and one properly labeled soft copy in a CD (refer KUHS website) of the dissertation thus prepared shall be submitted to KUHS on the 29th month of commencement of the course / 31st Oct. of the 3rd academic year, whichever falls first.** Dissertation should preferably be sent to a minimum of three reviewers / examiners /assessors, of which two shall be from outside the state and one from the affiliated colleges of KUHS. If modifications are to be made as specified, three hard copies and one soft copy of the dissertation after corrections made by the candidates should be submitted within a minimum of 30 days to the University.

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Consent for acceptance for evaluation of dissertation should be obtained from the reviewer/examiner/assessor before the dissertation are despatched. Proforma for evaluation of dissertation should be sent along with the copies of the dissertation to the reviewers appointed by the university. The proforma should contain all the assessment criteria with the clause – **Accepted/Accepted with modifications/Rejected** and reasons for rejection by the examiner. This proforma should be sent back to the University within two weeks / within the date specified after receipt of dissertation. The dissertation may be declared accepted if more than 50% of the reviewers (2 in the case of 3 reviewers) have accepted it. If modifications are to be made as specified, 3 hard copies and one soft copy of the dissertation after corrections made by the candidate should be submitted within 30 days to the University which may be sent back to the same examiner/s by the University for Acceptance after a fee has been levied from the candidate. If the dissertation has been rejected by more than 50% of the reviewers (2 in the case of 3 reviewers), the dissertation may be reviewed by an Expert Reviewing Committee comprising of not less than two subject experts, Dean (Research) of KUHS and Guide of the candidate provided the Guide requests for a review, after a fee has been levied from the candidate. If rejected by the Reviewing Committee, the candidate should take up a new topic and undergo all the procedures of submitting the synopsis, fees, IEC clearance, etc as prescribed by the University. The candidate who takes up the new topic can appear only for the subsequent examination.

Approval of dissertation work is an essential precondition for a candidate to appear in the University examination. Hall tickets for the university examination should be issued to the candidate only if the dissertation has been accepted.

A candidate whose dissertation has been accepted by the examiners and approved by the University, but who is declared to have failed at the final examination will be permitted to reappear at the subsequent MDS examination without having to prepare a dissertation.

Guide – The academic qualification and teaching experience required for recognition by the University as a guide for dissertation work is as laid down by the Dental Council of India / KUHS.

Co-guide – A co-guide may be included provided the work requires substantial contribution from the same department or a sister department or from another institution recognized for teaching/training by KUHS/DCI. The co-guide should fulfill the academic qualification and teaching experience required for recognition by the University as a co-guide for dissertation work.

Change of Guide – In the event of a registered guide leaving the college for any reason or in the event of death of guide, guide may be changed with prior permission from the University.

2.15 Speciality training if any

Present in clause 2.6

2.16 Project work to be done if any

Present in clause 2.6

2.17 Any other requirements [CME, Paper Publishing etc.]

Present in clause 2.6

2.18 Prescribed/recommended textbooks for each subject

Applied Basic Sciences

SUBJECT	NAME OF AUTHOR	NAME OF BOOK
Anatomy	BD Chaurasia	BD Chaurasia's Human Anatomy
	William, Peter L	Grays Anatomy
Oral Anatomy	Ash, Major M	Wheelers Dental Anatomy, Physiology and Occlosion
	Sicher, Harry, Du Brull , Llyod	Oral Anatomy
Oral Histology	Bhaskar B.N. Ed	Orbans Oral Histology and Embryology
	Avery, James K	Essentials of Oral Histology and Embryology
Embryology	Sadler	Langmans Medical Embryology
	Inderbeer Singh	Human Embryology
Physiology	Guyton Arthur and John L Hall	Text Book of Medical Physiology
	Ganong, William F	Review of Medical Pysiology
Pharmacology	KD Tripathi	Essentials of Medical Pharmachology
	Hardman, Joel G	Goodman and Gillmans pharmacological basis of Therapeutics
Nutrition	Nizel	Nutrition in Preventive Dentistry: Science and Practice
General Pathology	Cotran, Ramzi S and Others	Robbins Pathologic Basis of Disease
	Harsh Mohan	Textbook of Pathology
Oral Pathology	Shaffer, William and Others	Textbook of Oral Pathology
	Neville, Brad W and Others	Oral and Maxillofacial Pathology
Microbiology	Ananthanarayan and Panicker	Textbook of Microbiology
	Lakshman S	Essential Microbiology for Dentistry

Biostatistics	Dr. Symalan	Statistics in Medicine
	Soben Peter	Essentials of Preventive and Community Dentistry
	Sunder Rao and Richard J.	Introduction to Biostatistics and Research Methods

ENDODONTICS

1. Pathways of the Pulp	Stephen Cohen	10th Edition
2. Ingle's Endodontics	John Ingle	6th Edition
3. Endodontic Therapy	Franklin S. Weine	7th Edition
4. Grossman's Endodontic Practice	Suresh Chandra, Gopikrishna	12th Edition
5. Color Atlas Of Microsurgery In Endodontics	Syngcuk Kim	Nov. 2000
6. Endodontic Microsurgery	Enrique Merino	1st Edition
7. Endodontic Surgery	C R Stockdale	Nov. 1992
8. Endodontics	Christopher J. R. Stock, KishorGulabivala And Richard T. Walker	3rd Edition
9. Endodontics	Mahmoud Torabinejad	4th Edition
10. Essential End odontology	D Orstavik	
11. Text Book Of Endodontics	MithraHegde	
12. Textbook Of Endodontics	Garg	

CONSERVATIVEDENTISTRY

1. Sturdevant's Art & Science of Operative Dentistry	Harold Heymann	6th edition
2. Summit's Fundamentals of Operative Dentistry: A Contemporary Approach	Thomas J Hilton	4th edition

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3. Operative Dentistry Modern Theory and Practice	M A Marzouk	2nd edition
4. Pickard's Manual of Operative Dentistry	E A M Kidd	1996
5. Advanced Operative Dentistry	Luiz Narciso Baratieri	Dec. 1993
6. Advances in Operative Dentistry: Volume 1: Contemporary Clinical Practice	Jean-Francois Roulet	Aug. 2001
7. Advances in Operative Dentistry: Volume 2: Challenges of the Future	Jean-Francois Roulet	Oct. 2001
8. Decision Making in Operative Dentistry	Paul A. Brunton	Dec. 2002
9. Failure in the Restored Dentition: Management and Treatment	Michael D. Wise	Jan. 1995
10. Minimally Invasive Restorations with Bonding	M Degrange	Jan. 1997
11. Operative Dentistry : A Practical Guide to Recent Innovations (Clinical Sciences in Dentistry)	Hugh Devlin	1st edition
12. Restorative Dentistry	A. D. Walmsley	June 2002
13. Restorative Dentistry An Integrated Approach	P H Jacobsen	Aug. 1998
14. Clinical Operative	Ramya Raghu.	

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Dentistry-

DENTAL MATERIALS

1. Phillips' Science of Dental Materials	Kenneth J	11th Edition
2. Craig's Restorative Dental Materials	John M.	12th Edition
3. Restorative Dental Materials	Robert G. Craig	11th Edition
4. Applied Dental Materials	J F McCabe	7th Edition
5. Clinical Aspects of Dental Materials: Theory Practice and Cases	Marcia Gladwin	2nd Edition
6. Clinical Aspects of Dental Materials: Theory Practice and Cases	Marcia A Gladwin	3rd Edition
7. Dental Biomaterials	Bagby	
8. Dental Materials and Their Selection	William J. O'Brien	3rd Edition
9. Dental Materials: Properties and Manipulation	John M. Powers	9th edition
10. Introduction to Dental Materials	Richard Van Noort	2nd Edition
11. Introduction to Dental Materials	Richard Van Noort	3rd Edition
12. Materials in Dentistry Principles and Applications	Jack L Ferracane	2nd Edition
13. Materials Science for Dentistry	Dr. Brian W. Darvell S. Mahalaxmi	9th Edition
14. Materials Used in Dentistry		

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2.19 Reference books

As suggested by HOD

2.20 Journals

1. Journal of Endodontics
2. International Endodontic Journal
3. Journal of Operative Dentistry
4. Dental Clinics of North America
5. Dental Materials
6. Endodontics & Dental Traumatology
7. Australian Dental Journal
8. JADA
9. Journal of Dental Research
10. Journal of Restorative & Esthetic Dentistry
11. British Dental Journal
12. Journal of Indian Dental Association
13. Journal of Conservative Dentistry
14. International Dental Jounral
15. Journal of Dentistry
16. Journal of Dental Materials

2.21 Logbook

- **Work Diary / Log Book**

Logbooks serve as a document of the trainee's work. The trainee shall maintain this Logbook of the special procedures/operations observed/assisted/performed by him/her during the training period right from the point of entry and its authenticity shall be assessed weekly by the concerned Post Graduate Teacher / Head of the Department. This shall be made available to the Board of Examiners for their perusal at the time of his / her appearing at the Final examination. The logbook should record clinical cases seen and presented, procedures and tests performed, seminars, journal club and other presentations. Logbook entries must be qualitative and not merely quantitative, focusing on learning points and recent advances in the area and must include short review of recent literature relevant to the entry. A work diary

containing all the various treatment done by the candidate in the course of the study should also be maintained. The work diary shall be scrutinized and certified by both the guide/co guide and Head of the Department and presented in the University practical/clinical examination.

3 EXAMINATIONS

3.1 Eligibility to appear for exams

Every candidate to become eligible to appear for the **MDS examination** shall fulfill the following requirements.

Attendance

Every candidate shall have fulfilled the attendance prescribed by the University during **each academic year** of the Postgraduate course. A candidate becomes eligible for writing the University examination only after the completion of 36 months from the date of commencement of the course. The candidates should have completed the training period before the commencement of examination.

Dissertation

Approval of the dissertation is mandatory requirement for the candidate to appear for the university examinations.

Library Dissertation

Submission of library dissertation as per the regulations of DCI / KUHS is mandatory for a candidate to appear for the university examination.

Progress and Conduct

Every candidate shall have participated in seminars, journal review meetings, symposia, conferences, case presentations, clinics and didactic lectures during each year as designed by the concerned department.

Work Diary and Logbook

Every candidate shall maintain a work diary and logbook for recording his/her participation in the training programmes conducted by the department. The work diary and logbook shall be verified and certified by the Head of the department.

The certification of satisfactory progress by the Head of the Department and Head of the Institution shall be based on checklist given in 5.1 to5.8..

- **Students should note that in case they do not complete the exercises and work allotted to them within the period prescribed, their course requirements will be considered unfulfilled.**
- **Clinical Records, Work Diaries and Logbooks should be maintained regularly and approved by the guide, duly certified by the Head of the Department.**

3.2 Schedule of Regular/Supplementary exams

The MDS examination shall be held at the end of the third academic year. The university shall conduct two examinations in a year at an interval of four to six months between two examinations. **Not more than two examinations shall be conducted in an academic year.**

3.3 Scheme of examination showing maximum marks and minimum marks

- MDS examination will consist of written (Theory), Viva Voce, and Practical / Clinical examinations.

Written Examination (Theory) : 300 Marks

Written examination shall consist of **four question papers**, each of three hours duration . Each paper shall carry 75 marks. The type of questions in the first three papers will be two long essay questions carrying 20 marks each and five short essay questions each carrying seven marks. **There will be no options in the questions in the first 3 papers. Fourth paper will be a single essay question paper which will carry an option and the candidate is to answer only one of the essays.** Questions on recent advances may be asked in any or all the papers. **The syllabus for the theory papers of the concerned specialty should cover the entire field of the subject. Though the topics assigned to the different papers are generally evaluated under designated papers, a strict division of the subject may not be possible and some overlapping of topics is inevitable. Students should be prepared to answer overlapping topics.** The theory examinations shall be held sufficiently earlier than the practical/clinical examinations so that the answer books can be assessed and evaluated before the start of the practical/clinical examination. The total marks for the theory examination shall be 300.

Practical Examination ; 200 Marks

In case of practical examination, it should aim at assessing competence and skills of techniques and procedures. It should also aim at testing student's ability to make relevant and valid observations, interpretation and inference of laboratory or experimental or clinical work relating to his/her subject for undertaking independent work as a specialist. The total mark for practical/clinical examinations shall be 200.

Viva voce : 100 Marks

Viva voce examination shall aim at assessing depth of knowledge, logical reasoning, confidence and oral communication skills. The candidate may be given a topic for the pedagogy in the beginning of the clinical examination and asked to make a presentation on the topic for 8-10 minutes. The total marks shall be 100 of which 80 would be for the viva voce (20 marks/examiner) and 20 marks for the pedagogy.

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3.4 Papers in each year

Paper-I- Applied Anatomy, Physiology, Pathology and dental materials
Paper-II - Conservative dentistry & Aesthetic Dentistry
Paper-III- Endodontics
Paper IV - Essay

3.5 Details of theory exams

Distribution of topics for each paper will be as follows:

PAPER-I : Applied Basic Sciences: Applied Anatomy, Physiology, Pathology including Oral Microbiology, Pharmacology, Biostatistics and Research Methodology and Applied Dental Materials.
PAPER-II : Conservative Dentistry
PAPER-III: Endodontics
PAPER-IV: Essay

3.6 Model Question papers

MDS - CONSERVATIVE DENTISTRY AND ENDODONTICS

Paper – I - Applied Anatomy, Physiology, Pathology and Dental materials

(Answer all questions) Time 3hrs.

Marks 75

Long essay **(2 x 20 = 40 marks)**

1.Discuss the various impression materials used for fabrication of cast restorations.

2.Pain pathway and management of pain in endodontics.

Short essays **(5 x 7 == 35marks)**

3.Anticariogenic materials

4.Hyper sensitivity and anaphylaxis

5.CAD – CAM

6.Methods of testing biocompatibility of dental materials

7.Inlay Wax

Paper II – Conservative Dentistry & Aesthetic Dentistry

(Answer all questions) Time 3hrs

Marks 75

Long Essays **(2x 20 = 40marks)**

1.Explain the different types of tooth contacts and contours. How will you attain contacts and contours in class II composite restorations.

2.What are the modern techniques in caries detection? How will you prevent dental caries.

Short essays **(5 x 7 =35marks)**

3.Bleaching of vital teeth

4.Isolation of operating field

5.Golden proportion in aesthetics

6.Advances in minimal invasive dentistry

7.Gingival retraction

Paper–III Endodontics

(Answer all questions) Time 3hrs

Marks 75

Long Essays **(2x 20= 40marks)**

1.Write on rationale of endodontic treatment. add a note on various phases of treatment.

2.Classify traumatic injuries of teeth. Write on management of horizontal root fractures.

Short essays **(5 x 7 = 35marks)**

3.Recent advances in endodontic irrigants

4.Materials used to repair root perforations

5.Management of cervical resorption

6.Laser Doppler Flowmetry

7.Lasers in endodontics

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Paper – IV Conservative Dentistry and Endodontics with emphasis on Recent advances

(Answer only one question)

Time 3 hrs Marks 75

Recent Advances in Dentin Bonding

OR

Biofilm in Endodontics

3.7 Internal assessment component

Not applicable.

3.8 Details of practical

III. Duration - Two Days

IV. Time - 9 am to 4pm

Clinical examination – Three Exercises- 200marks

The Practical / Clinical examination will include Conservative Dentistry, Endodontics and Dental Materials.

Day 1 Fore noon

- Exercise I–Tooth preparation for cast post and core and inlay wax impression
- Exercise II- Rubber dam placement, access cavity preparation, pulp extirpation, working length determination, biomechanical preparation and master cone radiograph – on molar tooth.
- Evaluation of preclinical exercises, clinical records and other academic activities.

After noon

- Exercise III –Class II Composite Restoration on molar

Day II

Forenoon

- Gingival retraction and Impression taking after cementation of post and core.

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After noon

- Viva voce (including presentation of dissertation /pedagogy).

  Marks 100

MARK DISTRIBUTION OF PRACTICAL EXAMINATION & VIVA- VOCE

Practical /Clinical Examination- 200Marks

1. Evaluation of preclinical exercises, clinical records, other academic activities and overall performance during the course **25marks**
2. **Clinical procedures**

2.1 Cast Post and Core 50 marks

a. Case presentation and treatment plan 10

b. Evaluation of post space preparation 10

c. Coronal preparation 10

d. Wax pattern 10

e. Gingival retraction and impression 10

2.2. Molar RCT 75 marks

a. Case presentation and treatment plan 10

b. Isolation and fluid control 10

c. Access cavity preparation 20

d. Working length determination 10

e. Pulp space preparation 15

f. Master Cone Selection 10

2.3. Class II Composite restoration on molar 50marks

a. Case presentation and treatment planning 5

b. Isolation and fluid control 10

c. Tooth preparation 15

d. Matricing and wedging 10

e. Restoration 10

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Viva Voce- **100Marks**

i. Viva-Voce examination: 80

All examiners will conduct viva-voce conjointly on candidate's comprehension, analytical approach, expression, interpretation of data and communication skills.

ii. Dissertation presentation /Pedagogy(10+10=20) 20

3.9 Number of examiners needed (Internal & External) and their qualifications

There shall be at least four examiners in each branch of study. Out of four, two (50%) should be external examiners and two shall be internal examiners. The qualification and teaching experience for appointment as an examiner shall be as laid down by the DCI. The external examiners shall ordinarily be invited from another recognized University from outside the state. An external examiner may ordinarily be appointed for the same institute for not more than two years consecutively. Thereafter he may be reappointed after an interval of one year. The same set of examiners shall ordinarily be responsible for the practical and oral part of the examination.

The Head of the Department shall ordinarily be one of the examiners and the chairperson of the Board of Examinations; second internal examiner shall rotate after every two consecutive examinations if there are more than two postgraduate teachers in the department other than the Head of the department. No person who is not an active Postgraduate teacher in that subject can be appointed as Examiner. However in case of retired personnel, a teacher who satisfies the above conditions could be appointed as examiner up to one year after retirement.

For the MDS examination, if there are no two qualified internal examiners in an institute the second internal examiner can be from a neighbouring DCI and KUHS approved / recognized Dental College having PG course in the specific speciality. This examiner should be an active PG teacher in the same speciality with the qualifications and experience recommended for a teacher for postgraduate degree programme. The examination can also be conducted by one qualified internal examiner and three qualified external examiners if there is no qualified second internal examiner.

Reciprocal arrangement of Examiners should be discouraged, in that, the internal examiner in a subject should not accept external examinership of a college from which the external examiner is appointed in his subject in the same academic year.

3.10 Details of viva

Viva Voce :100 Marks

i. Viva-Voce examination :80marks

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All examiners will conduct viva-voce conjointly on candidate's comprehension, analytical approach, expression, interpretation of data and communication skills. It includes all components of course contents. It includes presentation and discussion on dissertation also.

ii. Pedagogy and thesis presentation : 10 +10 = 20marks

4.INTERNSHIP

Not applicable in PG Courses

5.ANNEXURES

5. Check Lists for Monitoring: Log Book, Seminar Assessment etc.

CHECKLISTS and LOGBOOK

5.1Checklist 1

Model Checklist for Evaluation of Preclinical Exercises

Name of Student: Date:

Name of the Faculty-in-charge:

Name of Exercise

Sl. No:	Items for observation during evaluation	Score
1	Quality of Exercise	
2	Ability to answer to questions	
3	Punctuality in submission of exercise	
4	TOTAL SCORE	

Performance	Score
Poor	0
Below Average	1
Average	2
Good	3
Very good	4

Signature of Faculty-in-charge

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5.2:Checklist 2

Model Checklist for Evaluation of Journal Review / Seminar Presentation

Name of Student: Date:

Name of the Faculty/Observer:

Name of Journal / Seminar:

Sl. No:	Items for observation during evaluation	Score
	Relevance of Topic	
2	Appropriate Cross references	
3	Completeness of Preparation	
4	Ability to respond to questions	
5	Effectiveness of Audio-visual aids used	
6	Time Scheduling	
7	Clarity of Presentation	
8	Overall performance	
9	TOTAL SCORE	

Performance	Score
Poor	0
Below Average	1
Average	2
Good	3
Very good	4

Signature of Faculty/Observer

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5.3:Checklist 3

Model Checklist for Evaluation of Clinical Case and Clinical Work

Name of Student: Date:

Sl. No:	Items for observation during evaluation	Score
1	History	
	Elicitation	
	Completeness	
2	Examination	
	General Examination	
	Extra oral examination	
	Intraoral examination	
3	Provisional Diagnosis	
4	Investigation	
	Complete and Relevant	
	Interpretation	
5	Diagnosis	
	Ability to defend diagnosis	
6	Differential Diagnosis	
	Ability to justify differential diagnosis	
7	Treatment Plan	
	Accuracy	
	Priority order	
8	Management	
9	Overall Observation	
	Chair side manners	
	Rapport with patient	
	Maintenance of Case Record	
	Quality of Clinical Work	
	Presentation of Completed Case	
10	TOTAL SCORE	

Performance	Score
Poor	0
Below Average	1
Average	2
Good	3
Very good	4

Name of the Faculty/Observer:

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5.4:Checklist 4

Model Checklist for Evaluation of Library Dissertation Work

Name of Student: Date:

Name of the Faculty/Guide:

Sl. No:	Items for observation during evaluation	Score
1	Interest shown in selecting topic	
2	Relevance of Topic	
3	Preparation of Proforma	
4	Appropriate review	
5	Appropriate Cross references	
6	Periodic consultation with guide	
7	Completeness of Preparation	
8	Ability to respond to questions	
9	Quality of final output	
9	TOTAL SCORE	

Performance	Score
Poor	0
Below Average	1
Average	2
Good	3
Very good	4

Signature of Faculty/Guide

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5.5:Checklist 5

Model Checklist for Evaluation of Dissertation Work

Name of Student: Date:

Name of the Faculty/Guide/Co-guide:

Sl. No:	Items for observation during evaluation	Score	Performance	Score
1	Interest shown in selecting topic		Poor	0
2	Relevance of Topic		Below Average	1
3	Preparation of Proforma		Average	2
4	Appropriate review		Good	3
5	Appropriate Cross references		Very good	4
6	Periodic consultation with guide/co- guide			
7	Depth of Analysis / Discuss			
8	Ability to respond to questions			
9	Department Presentation of findings			
10	Quality of final output			
	TOTAL SCORE			

Signature of Faculty/Guide/Co-guide

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5.6:CHECKLIST-6

CONTINUOUS EVALUATION OF DISSERTATION WORK BY GUIDE/CO-GUIDE

Name of the Trainee: Date

Name of the Faculty/Observer:

SI.No.	Items for observation during presentation	Poor 0	Below Average 1	Average 2	Good 3	Very Good 4
1.	Periodic consultation with guide / co- guide					
2.	Regular collection of case material					
3.	Depth of Analysis / Discussion					
4.	Department presentation of findings					
5.	Quality of final output					
6.	Others					
	Total score					

Signature of the guide / co-guide

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5.7:CHECKLIST -7

OVERALL ASSESSMENT SHEET

Name of the College: Date:

Name of Department:

Check List No	PARTICULARS	Name of trainee		
		First Year	Second Year	Third Year
1	Preclinical Exercises			
2.	Journal Review Presentation			
3.	Seminars			
4	Library dissertation			
5.	Clinical work			
6-	Clinical presentation			
7.	Teaching skill practice			
8.	Dissertation			
	TOTAL			

Signature of HOD **Signature of Principal**

The above overall assessment sheet used along with the logbook should form the basis for certifying satisfactory completion of course of study, in addition to the attendance requirement.

Key:

Mean score: Is the sum of all the scores of checklists 1 to 6

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5.8. LOGBOOK

DEPARTMENT OF ……..

MDS Programme

LOG BOOK OF

NAME…….

BIODATA OF THE CANDIDATE

EXPERIENCE BEFORE JOINING P.G. COURSE

DETAILS OF POSTING :

- **FIRST YEAR**
- **SECOND YEAR**
- **THIRD YEAR**

DETAILS OF LEAVE AVAILED

PRECLINICAL EXERCISES

LIBRARY DISSERTATION

RESEARCH WORK

PARTICIPATION IN CONFERENCES – CDE PROGRAMMES

DETAILS OF PARTICIPATION IN ACADEMIC PROGRAMME

SEMINARS /SYMPOSIA PRESENTED

JOURNAL CLUBS

TEACHING ASSIGNMENTS – UNDERGRADUATES / PARAMEDICAL.

SPECIAL DUTIES (IF ANY)

INTERNAL ASSESSMENT

DAILY ACTIVITIES RECORD (BLANK PAGES)

ONE PAGE FOR EACH MONTH X 36 PAGES

MISCELLANEOUS

SUMMARY

5.8.1. LOGBOOK-1

ACADEMIC ACTIVITIES ATTENDED

Name:

Admission Year:

College:

Date	Type of activity - Specify Seminar, Journal club, Presentation, UG teaching	Particulars

5.8.2. LOG BOOK -2

ACADEMIC PRESENTATIONS MADE BY THE TRAINEE

Name :

Admission Year:

College:

Date	Topic	Type of activity - Specify Seminar, Journal club, Presentation, UG teaching

5.8.3. LOGBOOK-3

DIAGNOSTIC AND OPERATIVE PROCEDURES PERFORMED

Name

Admission Year:

College:

Date	Name	OP No.	Procedure	Category **0,** A, PA, PI

Key:

O- WASHED UP AND OBSERVED - INITIAL 6 MONTHS OF ADMISSION

A-ASSISTED A MORE SENIOR SURGEON -1 YEAR MDS

PA - PERFORMED PROCEDURE UNDER THE DIRECT SUPERVISION OF A SENIOR SURGEON - II YEAR MDS

PI-PERFORMED INDEPENDENTLY - III YEAR MDS

REGULATIONS 2016

SYLLABUS

for Courses affiliated to the

Kerala University of Health Sciences

Thrissur 680596

Master of Dental Surgery (MDS)

Orthodontics and Dentofacial Orthopaedics

Course Code:245

(2016-17 Academic year onwards)

2016

2. COURSE CONTENT

2.1 Title of course:

MDS Orthodontics and Dentofacial Orthopaedics

2.2 Objectives of course

1. Goals

The goals of postgraduate training in various specialities are to train the BDS graduate who will:

- Practice respective specialty efficiently and effectively, backed by scientific knowledge and skill.
- Exercise empathy and a caring attitude and maintain high ethical standards.
- Continue to evince keen interest in continuing professional education in the specialty and allied specialties irrespective of whether in teaching or practice.
- Willing to share the knowledge and skills with any learner, junior or a colleague.
- To develop the faculty for critical analysis and evaluation of various concepts and views, to adopt the most rational approach.

2. Objectives

The objective is to train a candidate so as to ensure higher competence in both general and special area of interest and prepare him for a career in teaching, research and specialty practice. A candidate must achieve a high degree of clinical proficiency in the subject matter and develop competence in research and its methodology as related to the field concerned.

The above objectives are to be achieved by the time the candidate completes the course. The objectives may be considered as under –

1. Knowledge (Cognitive Domain)
2. Skills (Psychomotor Domain)
3. Human values, ethical practice and communication abilities.

2.1. Knowledge

- Demonstrate understanding of basic sciences relevant to the specialty.
- Describe etiology, pathophysiology, principles of diagnosis and management of common problem within the specialty in adults and children.
- Identify social, economic, environmental and emotional determinants in a given case and take them into account for planning treatment.
- Recognize conditions that may be outside the area of specialty/competence and to refer them to an appropriate specialist.

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- Update knowledge by self-study and by attending courses, conferences and seminars relevant to specialty.
- Undertake audit; use information technology and carryout research both basic and clinical with the aim of publishing or presenting the work at various scientific gatherings.

2.2. Skills

- Take a proper clinical history, examine the patient, perform essential diagnostic procedures and order relevant tests and interpret them to come to a reasonable diagnosis about the condition.
- Acquire adequate skills and competence in performing various procedures as required in the specialty.

2.3. Human values, ethical practice and communication abilities

- Adopt ethical principles in all aspects of practice.
- Foster professional honesty and integrity.
- Deliver patient care, irrespective of social status, caste, creed, or religion of the patient.
- Develop communication skills, in particular skill to explain various options available in management and to obtain a true informed consent from the patient.
- Provide leadership and get the best out of his team in congenial working atmosphere.
- Apply high moral and ethical standards while carrying out human or animal research.
- Be humble and accept the limitations in his knowledge and skill and to ask for help from colleagues when needed.
- Respect patient's rights and privileges including patient's right to information and right to seek a second opinion.

2.3 Medium of instruction:

The medium of instruction for the course shall be English.

2.4 Course outline

Orthodontics deals with the prevention, interception and correction of dentofacial anomalies and malocclusion and the harmonizing of the structures involved, so that the dental mechanisms will function in a normal way.

2.5 Duration

The course shall be of **three years** duration. All the candidates for the degree of MDS are required to pursue the recommended course for at least three academic years as

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full time candidates in an institution affiliated to and approved for Postgraduate studies by KUHS, observing the norms put forward by the DCI.

i. There will be no reduction for the course duration for any of the students including service candidates, diploma holders and those who have done senior house surgeoncy or equivalent research experience.
ii. No student shall be permitted to complete the course by attending more than 6 continuous years.
iii. A candidate selected for admission in a Dental College is obliged to follow the curriculum, rules and regulations as approved by the Dental Council of India and the University. Curriculum, rules or regulations are subject to changes from time to time.

2.6 Subjects

The program outlined, address both the knowledge needed in Orthodontics and allied Medical specialties in its scope. A minimum of three years of formal training through a graded system of education as specified, will equip the trainee with skill and knowledge at its completion to be able to practice basic Orthodontics and have the ability to intelligently pursue further apprenticeship towards advanced orthodontics.

SPREAD OF THE CURRICULUM

A. 6 months teaching of basic subjects including completion of pre-clinical exercises.
B. 2 ½ years of coverage of all the relevant topics in orthodontics, clinical training involving treatment of patients and submission of dissertation. These may be divided into blocks of 6 to 8 months duration each, depending on the training policies of each institution.

1. Pre-Clinical Exercises

A general outline of the type of exercise is given here. Every institution can decide the details of exercises under each category.

1. General Wire bending exercises to develop the manual dexterity.
2. Clasps, Bows and springs used in the removable appliances.
3. Soldering and welding exercises.
4. Fabrication of removable habit braking, mechanical and functional appliances, also all types of space maintainers and space regainers.
5. Bonwill Hawley ideal arch preparation

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6. Construction of orthodontic models trimmed and polished preferably as per specifications of Tweed or A.B.O.
7. Cephalometric tracings and various Analyses, also superimposition methods.
8. Fixed appliance typodont exercises.
   8.1. Training shall be imparted in one basic technique i.e. Standard Edgewise/Begg technique or its derivatives/Straight wire etc. with adequate exposure to other techniques.
   8.2. Typodont exercise.
      8.2.1. Band making
      8.2.2. Bracket positioning and placement
      8.2.3. Different stages in treatment appropriate to technique taught.
9. Clinical Photography – Submit album containing
   9.1. Basic principles of photography, details of clinical photography
   9.2. Camera and adjustment specifications
   9.3. Standard, Extra and Intra oral photographs with photographic analysis
10. Computerized imaging
11. Preparation of surgical splints, and splints for TMJ problems
12. Handling of equipments like vacuum forming appliances and hydrosolder etc.

First Year

I. Basic Pre-Clinical Exercise Work for the MDS Students:

First 6 Months

1. NON-APPLIANCE EXERCISES

All the following exercises should be done with round wire of appropriate thickness

Sl. No.	Exercise	No.
1	Straightening of 6"& 8" long wire	1 each
2	Square of 2” side	1
3	Rectangle of 2” x 1” sides	1
4	Triangle of 2" side	1
5	Circle of 2" diameter	1
6	Bending of 5 U's	1
7	Bending of 5 V's	1

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2. CLASPS

Sl. No	Exercise	No.
1	¾ Clasps	2
2	Full clasps	2
3	Triangular Clasps	2
4	Adam's clasp - upper molar	2
5	Adam's Clasp - lower molar	2
6	Adam's Clasp - Pre-molar	2
7	Adam's Clasp – Incisor	2
8	Modification of Adam's - With Helix	2
9	Modification of Adam's - With distal extension	2
10	Modification of Adam's - With soldered tube	2
11	Duyzing Clasps on Molars	2
12	Southend Clasp	1

C. LABIALBOWS

SL NO	Exercise	NO
1	Short labial bow (upper & lower)	1
2	Long labial bow (upper & lower)	1
3	Robert's retractor	1
4	High labial bow-with apron springs	1
5	Mill's labial bow	1
6	Reverse loop labial bow	1
7	Fitted labial bow	1
8	Split high labial bow	1

D. SPRINGS

Sl No	Exercise	No
1	Finger spring-mesial movement	2

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2	Finger spring-distal movement	2
3	Double cantilever spring	2
4	Flapper spring	2
5	Coffin spring	2
6	T spring	2

E. CANINE RETRACTORS

Sl No	Exercise	No
1	U loop canine retractor	2 PAIRS
2	Helical canine retractor	2 PAIRS
3	Palatal canine retractor	2 PAIRS

F. APPLIANCES

Sl No	Exercise
1	Hawley's retention appliance with anterior bite plane
2	Upper Hawley's appliance with posterior bite plane
3	Upper expansion appliance with coffin spring
4	Upper expansion appliance with expansion screw
5	Habit breaking appliance with tongue crib
6	Oral screen and double oral screen
7	Lip bumper
8	Splint Headgear
9	Catalans appliance
10	Activator
11	Bionator
12	Frankel-FR 2 appliance
13	Twin block
14	Lingual arch
15	TPA
16	Quad helix
17	Bonded Rapid Maxillary Expander

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18	Utility arches
19	Pendulum appliance

7. SOLDERING EXERCISES

SI.No.	Exercise	No.
1	Star	1
2	Comb	1
3	Christmas tree.	1
4	Soldering buccal tube onmolar bands	1

8. WELDING EXERCISES

SI.No.	Exercise
1	Pinching and welding of molar, premolar, canine and Incisor bands
2	Welding of buccal tubes and brackets on molar bands and incisor bands

9. Impression of upper and lower arches in alginate

10. Study model preparation

11. Model analysis

SI. No.	Exercise
1	Impression of upper and lower dental arches
2	PREPARATION OF STUDY MODEL -1 And all the permanent dentition analyses to be done.
3	PREPARATIONOFSTUDYMODEL–2 And all the permanent dentition analyses to be done.
4	PREPARATIONOFSTUDYMODEL–3 And all the mixed dentition analyses to be done.

12. CEPHALOMETRICS

SI. No.	Exercise
1	Lateral cephalogram to be traced in five different colors and super imposed to see the accuracy of tracing
2	Steiner's analysis

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3	Down's analysis
4	Tweed analysis
5	Rickett's analysis
6	Burrstone analysis
7	Rakosi's analysis
8	McNamara analysis
9	Bjork analysis
10	Coben's analysis
11	Harvold's analysis
12	Soft tissue analysis - Holdaway and Burstone

13. Basics of Clinical Photography including Digital Photography

14. Light wire bending exercises for the Begg technique

Sl. No.	Exercise
1	Wire bending technique on 0.016' wire circle "Z" Omega
2	Bonwill-Hawley diagram
3	Making a standard arch wire
4	Intermaxillary hooks- Boot leg and Inter Maxillary type
5	Upper and Lower arch wire
6	Bending a double back arch wire
7	Bayonet bends (vertical and horizontal offsets)
8	Stage-Ill arch wire
9	Torquing auxiliary (upper)
10	Reverse Torquing (lower)
11	Up righting spring

15. TYPHODONT EXERCISES

15.1 BEGG Technique

15.1.1 Teeth setting in Class-ll division I malocclusion with maxillary anterior proclination and mandibular anterior crowding

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15.1.2 Band pinching, welding brackets and buccal tubes to the bands

15.1.3 Stage-I

15.1.4 Stage-ll

15.1.5 Pre Stage-III

15.1.6 Stage-lll

15.2 Pre Adjusted Edgewise

15.2.1 Bonding full upper and lower arches

15.2.2 Upper/lower 016/018 continuous archwires with reverse curves

15.2.3 Making first, second and third order bends

15.2.4 .019x.025 stainless steel arch wires with soldered hook formation and putting reverse curves

15.2.5 Fabrication of U loop, Tear drop loop, T loop and putting alpha-beta bends

Orthodontic Topics

The under mentioned topics will be part of study in 3 year course. The educational methods recommended are: seminars, and workshops, review of literature and auto tutorials/ self-learning packages.

The syllabus for the theory of Orthodontics should cover the entire field of the subject and the following topics may be used as guidelines.

The concept of health care counseling shall be incorporated in all relevant areas.

Paper-I : Applied Basic Sciences: Applied anatomy, Physiology, Dental Materials, Genetics, Pathology, Physical Anthropology, Applied Research methodology, Bio-Statistics and Applied Pharmacology.

1. APPLIED ANATOMY:

1.1 Prenatal growth of head:

Stages of embryonic development, origin of head, origin of face, origin of teeth.

1.2 Postnatal growth of head:

Bones of skull, the oral cavity, development of chin, the hyoid bone, general growth of head, face growth.

1.3 Bone growth:

Origin of bone, composition of bone, units of bone structure, schedule of Ossification, mechanical properties of bone, roentgenographic appearance of bone

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1.4 Assessment of growth and development:

Growth prediction, growth spurts, the concept of normality and growth increments of growth, differential growth, gradient of growth, methods of gathering growth data. Theories of growth and recent advances, factors affecting physical growth.

1.5 Muscles of mastication:

Development of muscles, muscle change during growth, muscle function and facial development, muscle function and malocclusion

1.6 Development of dentition and occlusion:

Dental development periods, order of tooth eruption, chronology of permanent tooth formation, periods of occlusal development, pattern of occlusion.

1.7 Assessment of skeletal age

The carpal bones, carpal x – rays, cervical vertebrae

2. PHYSIOLOGY:

2.1 **Endocrinology and its disorders**

(Growth hormone, thyroid hormone, parathyroid hormone, ACTH) pituitary gland hormones, thyroid gland hormones, parathyroid gland hormones

2.2 **Calcium and its metabolism**

2.3 **Nutrition-metabolism and their disorders**: proteins, carbohydrates, fats, vitamins and minerals.

2.4 **Muscle physiology**

2.5 **Craniofacial Biology**: Cell adhesion molecules and mechanism of adhesion

2.6 **Bleeding disorders: Hemophilia**

3. DENTAL MATERIALS:

3.1 **Gypsum products:** dental plaster, dental stone and their properties, setting reaction etc.

3.2 **Impression materials:** impression materials in general and particularly of alginate impression material.

3.3 **Acrylics:** chemistry, composition physical properties

3.4 **Composites**: composition types, properties setting reaction

3.5 **Banding and bonding cements**: Zn (PO4)2, zinc silicophosphate, Zinc polycarboxylate, resin cements and glass Ionomer cements

3.6 **Wrought metal alloys**: deformation, strain hardening, annealing, recovery, recrystallization,

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grain growth, properties of metal alloys

3.7 **Orthodontic arch wires**: stainless steel gold, wrought cobalt chromium nickel alloys, alpha & beta titanium alloys , Nitinol, Aesthetic wires, Newer archwires

3.8 **Elastics:** Latex and non-latex elastics.

3.9 **Applied physics**, Bioengineering and metallurgy.

3.10 **Specification and tests methods** used for materials used in Orthodontics

3.11 **Survey of all contemporary literature and Recent advances in above – mentioned materials.**

4. GENETICS:

4.1 Cell structure, DNA, RNA, protein synthesis, cell division

4.2 Chromosomal abnormalities

4.3 Principles of orofacial genetics

4.5 Genetics in malocclusion

4.6 Molecular basis of genetics

4.7 Studies related to malocclusion

4.8 Recent advances in genetics related to malocclusion

4.9 Genetic counseling

4.10 Bioethics and relationship to Orthodontic management of patients.

5. PHYSICAL ANTHROPOLOGY:

5.1 Evolutionary development of dentition

5.2 Evolutionary development of jaws.

6. PATHOLOGY:

6.1 Inflammation

6.2Necrosis

7. BIOSTATISTICS:

7.1 Statistical principles

7.2 Data Collection

7.3 Method of presentation

7.4 Method of Summarizing

7.5 Methods of analysis – different tests/errors

7.6 Sampling and Sampling technique

7.7 Experimental models, design and interpretation

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7.8 Development of skills for preparing clear concise and cogent scientific abstracts and publication

8. APPLIED RESEARCH METHODOLOGY IN ORTHODONTICS:

8.1 Experimental study designs

8.2 Animal experimental protocol

8.3 Principles in the development, execution and interpretation of methodologies in Orthodontics

8.4 Critical Scientific appraisal of literature.

9. APPLIED PHARMACOLOGY

9.1 Pain management in Orthodontics

9.2 Effect of medications in Orthodontics

10. Ethics

10.1.Introduction to ethics
10.2. What is ethics?
10.3. What are values and norms?
10.4. How to form a value system in one's personal and professional life?
10.5.Hippocratic oath.
10.6.Ethics of the Individual
10.6.1. The patient as a person
10.6.2.Right to be respected
10.6.3 Truth and confidentiality
10.6.4 Autonomy of decision
10.6.5 Doctor patient relationship
10.7. Professional Ethics
10.7.1 Code of conduct
10.7.2 Contract and confidentiality

Paper II: **Orthodontic history, Concepts of Occlusion and Esthetics, Child and Adult Psychology, Etiology and classification of malocclusion, Dentofacial Anomalies, Diagnostic procedures and treatment planning in Orthodontics, Practice management in Orthodontics**

2.1 ORTHODONTIC HISTORY:

2.1.1 Historical perspective,

2.1.2 Evolution of orthodontic appliances,

2.1.3 Pencil sketch history of Orthodontic peers

2.1.4 History of Orthodontics in India

2.2 CONCEPTS OF OCCLUSION AND ESTHETICS:

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2.2.1 Structure and function of all anatomic components of occlusion,

2.2.2 Mechanics of articulation,

2.2.2.1Recording of masticatory function,

2.2.2.2 Diagnosis of Occlusal dysfunction,

2.2.2.3 Relationship of TMJ anatomy and pathology and related neuromuscular physiology.

2.3 ETIOLOGY AND CLASSIFICATION OF MALOCCLUSION:

- A comprehensive review of the local and systemic factors in the causation of malocclusion
- Various classifications of malocclusion

2.4 DENTOFACIALANOMALIES:

- Anatomical, physiological and pathological characteristics of major groups of developmental defects of the orofacial structures.

2.5 CHILD AND ADULT PSYCHOLOGY:

- Stages of child development.
- Theories of psychological development.
- Management of child in orthodontic treatment.
- Management of handicapped child.
- Motivation and Psychological problems related to malocclusion /orthodontics
- Adolescent psychology
- Behavioral psychology and communication

2.6 DIAGNOSTIC PROCEDURES AND TREATMENT PLANNING IN ORTHODONTICS

- Emphasis on the process of data gathering, synthesis and translating it into a treatment plan
- Problem cases – analysis of cases and its management
- Adult cases, handicapped and mentally retarded cases and their special problems
- Critique of treated cases.

Cephalometrics

- Instrumentation
- Image processing
- Tracing and analysis of errors and applications
- Radiation hygiene
- Advanced Cephalometrics techniques
- Comprehensive review of literature
- Video imaging principles and application.

Craniofacial Imaging - Advances

- Digital imaging
- Volumetric Imaging
- Computed Tomography
- Cone Beam Computed Tomography
- Laser Scanning
- Stereo photogrammetry
- Three dimensional facial Imaging
- Computed Tomography of TMJ
- Arthrography
- Magnetic Resonance Imaging

2.7 PRACTICE MANAGEMENT IN ORTHODONTICS:

- Economics and dynamics of solo and group practices
- Personal management
- Materials management
- Public relations
- Professional relationship
- Dental ethics and jurisprudence
- Office sterilization procedures
- Community based Orthodontics.

Paper III: Clinical Orthodontics

3.1 Myofunctional Orthodontics:

- Basic principles
- Contemporary appliances – their design and manipulation
- Case selection and evaluation of the treatment results
- Review of the current literature.

3.2 Dentofacial Orthopedics

- Principles
- Biomechanics
- Appliance design and manipulation –various appliances
- Review of contemporary literature

3.3 Cleft lip and palate rehabilitation:

- Diagnosis and treatment planning

- Mechanotherapy
- Special growth problems of cleft cases
- Speech physiology, pathology and elements of therapy as applied to orthodontics
- Team rehabilitative procedures.

3.4 Biology of tooth movement:

- Principles of tooth movement-review
- Review of contemporary literature
- Applied histophysiology of bone, periodontal ligament
- Molecular and ultra cellular consideration in tooth movement
    - Accelerated Orthodontics

3.5 Orthodontic / Orthognathic surgery:

- Orthodontist' role in conjoint diagnosis and treatment planning
- Pre and post-surgical Orthodontics
- Participation in actual clinical cases, progress evaluation and post retention study
- Review of current literature

3.6 Ortho / Perio / Prostho inter relationship

- Principles of interdisciplinary patient treatment
- Common problems and their management

3.7 Basic principles of Mechanotherapy Includes **Removable appliances** and all types of **FIXED APPLIANCES (Edgewiswe, Begg, Preadjusted Edgewise, Tip Edge, Lingual etc.,)**

- Design
- Construction
- Fabrication – arch wire fabrications/loop configurations/ Bracket positions/segmented/sectional
- Management
- Review of current literature on treatment methods and results

3.8 Applied preventive aspects in Orthodontics

- Caries and periodontal disease prevention
- Oral hygiene measures
- Clinical procedures

3.9 Interceptive Orthodontics

- Principles
- Growth guidance
- Diagnosis and treatment planning
- Therapy emphasis on:

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a. Dento-facial problems

b. Tooth material discrepancies

c. Minor surgery for Orthodontics

3.10 Retention and relapse

- Mechanotherapy – special reference to stability of results with various procedures
- Post retention analysis
- Review of contemporary literature

3.11 RECENT ADVANCES:

- Temporary Anchorage Devices
- Lasers
- Application of F.E.M.
- Distraction Osteogenesis
- Advances in Craniofacial Imaging
- Obstructive Sleep Apnoea-Orthodontic perspective
- Lingual Orthodontics
- Clear Aligners
- Self Ligating bracket system
- Periodontally Accelerated Osteogenic Orthodontics
- Orthodontic treatment impact on OHRQoL (Oral Health Related Quality ofLife)

Paper IV :**Essay**

4. **The teaching program** should be structured one with following aspects clearly spelt out.
   - Objectives and the expected learning outcome from each block of 6-8 months duration
   - Methods of teaching, individual topics namely didactic lectures, seminars, journal club, tutorials, discussion, etc.
   - Assessing method and the frequency of assessment.
   - Remedial measures
5. **Clinical training** in the following aspects.
   - Removable active appliances- 5cases
   - Class-Imalocclusion with Crowding
   - Class-Imalocclusion with bi-maxillary protrusion
   - Class-IIdivision-1
   - Class-IIdivision-2

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- Class-Ill (Orthopedic, Surgical, Orthodonticcases)
- Inter disciplinary cases
- Removable functional appliance cases like activator, Bionator, functional regulator, twin block and new developments
- Fixed functional appliances - Herbst appliance, jasper jumper etc - 5cases
- Dento-facial orthopedic appliances like heagears, rapid maxillary expansion NiTi expander etc., - 5cases
- Appliance for arch development such as molar distalization - 5cases
- Fixed mechano therapy cases (Begg, PEA, Tip edge, Edgewise)
- Retention procedures of above treated cases.

Other work to be done during FIRST YEAR

1. **Seminars:** One Seminar per week to be conducted in the department. A minimum of five seminars should be presented by each student each year
2. **Journal club:** One Journal club per week to re conducted in the department. A minimum of five should be presented by each student each year.
3. **Library assignment** to be submitted on or before the end of 10months.
4. Protocol for dissertation to be submitted on or before the end of nine months from the date of admission.
5. **Under graduate classes**: Around 4 - 5 classes should be handled by each post-graduate student
6. **Field survey:** To be conducted and submit the report
7. **Inter-departmental meetings:** should be held once in a month.
8. **Case discussions**
9. **Field visits:** To attend dental camps and to educate the masses
10. Basic subjects classes
11. Internal assessment or Term paper.

Second Year:

The clinical cases taken up should be followed under the guidance of a postgraduate teacher. More case discussions and cases to be taken up. Other routine work as follows.

1. **Seminars:** One Seminar per week to be conducted in the department. Each student should present a minimum of five seminars each year.
2. **Journal club:** One Journal club per week to be conducted in the department. Each student should present a minimum of five seminars each year.
3. **Undergraduate classes:** each post-graduate student should handle Around4-5classes.
4. **Inter-departmental meetings:** Should be held once in a month

5. **Case discussions**
6. **Field visits:** To attend dental camps and to educate the masses.
7. **Attendance in Conferences, CDEs, Workshops, etc.**
8. **Publication of Scientific Articles.**
9. **Internal assessment.**
10. **Dissertation work:** On getting the approval from the university work for the dissertation to be started.

Third Year:

The clinical cases taken up should be followed under the guidance. More cases discussions and cases to be taken up. Other routine work as follows:

1.Seminars: One Seminar per week to be conducted in the department. Each student should present a minimum of five seminars each year.

2.Journal Club: One Journal club per week to be conducted in the departments minimum of five should be presented by each student each year

3.Under graduate classes: each post - graduate student, should handle around 4-5classes.

4.Inter-departmental meetings: Should be held once in a month.

5.The completed dissertation should be submitted six months before the final examination (by the end of 29th month of commencement of course)

6.Case discussions

7.Field visits: To attend dental camps and to educate the masses.

8.Attendance in Conferences, CDEs, Workshops, etc.

9.Publication of Scientific Articles

10.Finishing and presenting the cases taken up.

11.Preparation of finished cases and presenting the cases (to be presented for the examination)

Mock examination

Allocation of patients

Each postgraduate student should start a minimum of 50 cases of his/her own: additionally he/she should handle a minimum of 25 transferred cases.

Active participation in or at least exposure to multi-disciplinary treatment is essential.

Dissertation

5.1. The protocol for dissertation should be submitted within 6months of start of course.

5.2. The completed dissertation should be submitted 6 months before the final examination.

5.3. The dissertation should not be just a repetition of a previously undertaken study but it should try to explore some new aspects.

5.4. The panel of examiners should approve the dissertation before the candidate appears for the

University examination.

6. Monitoring Learning Progress

It is essential to monitor the learning progress of each candidate through continuous app and regular assessment. It not only helps teachers to evaluate students, but also students to evaluate themselves. The monitoring should be done by the staff of the department and participation of students in various teaching / learning activities. It may be structured assessment be done using checklists that assess various aspects. Checklists are given in Section IV.

7. MDS Examination

Scheme of Examination: Theory : 300Marks
Practical: 200Marks
VivaVoce: 100Marks

Written examination shall consist of four question papers each of three hours duration. Total marks for each paper will be 75.

Title of the Papers

Paper I – Applied anatomy, physiology, pathology, genetics, physical anthropology & dental material

Paper II - Diagnosis and treatment planning

Paper III – Clinical Orthodontics and Mechanotherapy

Paper IV - Essay

Paper I, II and III shall consist of two long questions carrying 20 marks each and five short essay questions carrying seven marks each. Paper IV will be-one Essay. Questions on recent advances may be asked in any or all the papers.

Practical /Clinical Examination : 200 Marks

Exercise No: 1 Functional Case : 50 Marks

Selection of case for functional appliance with case discussion and recording of construction bite.

Fabrication and delivery of the appliance the next day with chairside viva.

Exercise No: 2 Multiband exercise 50 Marks

1. III stage with auxiliary springs

OR

2. Bonding of SWA brackets and construction

of suitable arch wire.

Exercise No. 3 Display of records of the treated cases along with patients (minimum of 5 cases) 5 cases x 15 marks = 75 Marks (including seminars, thesis, Library dissertation, certificates of conferences, courses, paper publications etc)

Exercise No:4-Long case discussions: 25 Marks

No	Exercise	Marks allotted	Approximate time
1	Functional appliance	50	2 hours
2	III stage mechanics/ Bonding an arch wire fabrication	50	1 hour 30 min
3	Display of case records (minimum of 5 cases to be presented with the patients)	75	1 hour
4	Long cases	25	2 hours

Viva Voce – Total 100 (80 marks for the grand viva and 20 marks for thesis defense / pedagogy)
All examiners will conduct viva-voce conjointly on candidate's comprehension, analytical approach expression, interpretation of data and communication skills. It includes all components of course contents. It includes presentation and discussion on dissertation also.

2.7 Total number of hours

As per the instruction given by the DCI

2.8 Branches if any with definition

Orthodontics and Dentofacial Orthopaedics

2.9 Teaching learning methods

Method of Training

The training of a postgraduate student shall be full time but graded responsibilities in the management and treatment of patients entrusted to his/her care. The participation of the students in all facets of educational process is essential. Every candidate should take part in seminars, group discussions, case demonstrations, clinics, journal review meetings, and clinical meetings. Every candidate shall be required to participate in the teaching and training programme of undergraduate students and interns. Training should include involvement in laboratory and experimental work, and research studies. Every Institution undertaking Post Graduate training programme shall set up an Academic cell or a Curriculum Committee, under the chairmanship of a Senior faculty member, which shall work out the details of the training programme in each speciality in consultation with other Department faculty staff and also coordinate and monitor the implementation of these training Programmes.

Based on the above guidelines for a structured training programme for postgraduate

courses, the basic tenets of a successful postgraduate teaching programme, are detailed under the following heads.

- **Formal Lectures** by the faculty on varied subjects including general areas and systems. Both senior and junior faculty can do this. However, the number of these classes should be maintained of low levels to encourage self-learning.
- **Symposia / Seminars** form an integral part of PG learning. A monthly symposium will generate approximate 30-35 symposia / course. These symposia can include department faculty and HODs as chairpersons and maximum involvement of both students and faculty should be ensured.
- **Clinical Discussions** form the core of PG training and can be assigned to various clinical units on rotating basis. However other faculty could also actively participate in the discussion. The discussions must be 3-4/week. One suggestion is to score the performance of the candidate by a small panel of faculty and convey the scores to the candidate / PG at the end of the session.
- **Journal Club /Clinical Club** should be conducted at least once in a week in each postgraduate department. Journal clubs not only imparts new information but also trains the candidate to objectively assess and criticize various articles which come out and should be useful in ensuring evidence based dentistry.
- **Guest Lectures** can be integrated into the PG program at least once in a month. Even the retired faculty can be invited for delivering the lectures and will ensure importing of greater wisdom to the candidates.
- **Orientation Classes** for newcomers should also be incorporated. These classes can even be assigned to junior faculty/senior PGs.
- **Clinical posting.** Each PG student should work in the clinics on regular basis to acquire adequate professional skills and competency in managing various cases to be treated by a specialist.
- **Clinico Pathological Conferences** should be held once a year involving the faculties of Oral Medicine and Radiology, Oral Pathology and concerned clinical department. The student should be encouraged to present the clinical details, radiological and histo- pathological interpretations and participation in the discussions.
- **Rotation postings in other departments** should be worked out by each department in order to bring in more integration between the speciality and allied fields.
- **Periodical Quiz** can be both informative and entertaining and should be encouraged and planned.
- **Computer Training and Internet Applications** are now becoming a must for both faculty and students. These areas should be strengthened as a next step. There can be a sort of internet information club in the departments.
- **Conferences/CDEs** – All postgraduate students should be encouraged to attend conferences and CDEs. They should also be asked to present papers wherever appropriate and should be rewarded by assigning scores for them.
- **Publication of scientific papers** – It is desirable and advisable to have at least two publications in the State/National/International indexed dental journals.
- **Involvement in Teaching Activity** – PG students can be assigned the job of teaching the undergraduate students and these will definitely improve the teaching skills in the postgraduate students.

Examinations

Evaluation is a continuous process, which is based upon criteria developed by the concerned authorities with certain objectives to assess the performance of the learner. This also indirectly helps in the measurement of effectiveness and quality of the concerned MDS programme. Evaluation is achieved by two processes

1) Formative or internal assessment

2) Summative or university examinations.

Formative evaluation is done through a series of tests and examinations conducted periodically by the institution. Summative evaluation is done by the university through examination conducted at the end of the specified course.

A candidate registered for MDS course must clear the final examination within six years of the date of admission. The examinations should be so organized that this shall be used as the mechanism to confirm that the candidate has acquired appropriate knowledge, skill and competence at the end of the training that he/she can act as a specialist and/or a medical teacher as per expectation. University examination will be held regularly by KUHS in April-May/October-November every year.

A candidate who wishes to study for MDS in a second specialty should have to take the full course of 3 years in that specialty and appear for examinations.

2.10 Content of each subject in each year

Present in clause 2.6

2.11 No: of hours per subject

Present in clause 2.6

2.12 Practical training

Present in clause 2.6

2.13 Records

Present in clause 2.20

2.14 Dissertation: As per Dissertation Regulations of KUHS

Every candidate pursuing MDS degree course is required to carry out work on a selected research project under the guidance of a recognized postgraduate teacher. The results of such a work shall be submitted in the form of a dissertation.

The dissertation is aimed to train a postgraduate student in research methods and techniques. It includes identification of a problem, formulation of a hypothesis, search and review of literature, getting acquainted with recent advances, designing of a research study, collection of data, critical analysis, and comparison of results and drawing conclusions.

Every candidate shall submit to the University in the prescribed format a synopsis containing particulars of proposed dissertation work after obtaining ethical clearance from the Institutional Ethical Committee **within six months from the date of commencement of the course or before the dates notified by the University**. The synopsis shall be sent only

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through the Principal of the institution.

Such synopsis will be reviewed and the dissertation topic will be registered by the university. No change in the dissertation topic or guide/coguide shall be made without prior approval of the University. The dissertation should not be just a repetition of a previously undertaken study but it should try to explore some new aspects. The dissertation should be written under the following headings:

i. Introduction
ii. Aims and Objectives of the study
iii. Review of Literature
iv. Methodology
v. Results
vi. Discussion
vii. Conclusion
viii. Summary
ix. References
x. Annexures

The written text of dissertation shall be not less than 50 pages and shall not exceed 150 pages excluding references, tables, questionnaires, and other annexures. It should be neatly typed (font size 13-Times New Roman or font size 13-Cambria) in 1.5 line spacing on one side of the paper (A4 size, 8.27" x 11.69") and bound properly. Spiral binding should be avoided. (Refer KUHS website). The guide, co-guide if any, Head of the Department and the Head of the Institution shall certify the dissertation.

For uniformity, it was suggested that the colour of the hard bind of the dissertation for all branches of MDS course in the purview of KUHS shall be dark brown with letters of gold colour. The title, author, and year of study should also be imprinted or embossed on the spine of the book. **Three hard copies and one properly labeled soft copy in a CD (refer KUHS website) of the dissertation thus prepared shall be submitted to KUHS on the 29th month of commencement of the course / 31st Oct. of the 3rd academic year, whichever falls first.** Dissertation should preferably be sent to a minimum of three reviewers / examiners /assessors, of which two shall be from outside the state and one from the affiliated colleges of KUHS. If modifications are to be made as specified, three hard copies and one soft copy of the dissertation after corrections made by the candidate should be submitted with in a minimum of 30 days to the University. Consent for acceptance for evaluation of dissertation should be obtained from the reviewer/examiner/assessor before the dissertation are dispatched. Proforma for evaluation of dissertation should be sent along with the copies of the dissertation to the reviewers appointed by the university. The proforma should contain all the assessment criteria with the clause – **Accepted/Accepted with modifications/Rejected** and reasons for rejection by the examiner. This proforma should be sent back to the University within two weeks / within the date specified after receipt of dissertation. The dissertation may be declared accepted if more than 50% of the reviewers (2 in the case of 3 reviewers) have accepted it. If modifications are to be made as specified, 3 hard copies and one soft copy of the dissertation after corrections made by the candidate should be submitted within 30 days to the University which may be sent back to the same examiner/s by the University for Acceptance after a fee has been levied from the candidate. If the dissertation has been rejected by more than 50% of the reviewers (2 in the case of 3 reviewers), the dissertation

may be reviewed by an Expert Reviewing Committee comprising of not less than two subject experts, Dean (Research) of KUHS and Guide of the candidate provided the Guide requests for a review, after a fee has been levied from the candidate. If rejected by the Reviewing Committee, the candidate should take up a new topic and undergo all the procedures of submitting the synopsis, fees, IEC clearance, etc., as prescribed by the University. The candidate who takes up the new topic can appear only for the subsequent examination.

Approval of dissertation work is an essential precondition for a candidate to appear in the University examination. Hall tickets for the university examination should be issued to the candidate only if the dissertation has been accepted.

A candidate whose dissertation has been accepted by the examiners and approved by the University, but who is declared to have failed at the final examination will be permitted to reappear at the subsequent MDS examination without having to prepare a dissertation.

Guide – The academic qualification and teaching experience required for recognition by the University as a guide for dissertation work is as laid down by the Dental Council of India / KUHS.

Co-guide – A co-guide may be included provided the work requires substantial contribution from the same department or a sister department or from another institution recognized for teaching/training by KUHS/DCI. The co-guide should fulfill the academic qualification and teaching experience required for recognition by the University as a co-guide for dissertation work.

Change of Guide – In the event of a registered guide leaving the college for any reason or in the event of death of guide, guide may be changed with prior permission from the University.

2.15 Speciality training if any

Present in clause 2.6

2.16 Project work to be done if any

Present in clause 2.6

2.17 Any other requirements [CME, Paper Publishing etc.]

Present in clause 2.6

2.18 Prescribed/recommended textbooks for each subject

Applied Basic Sciences

SUBJECT	NAME OF AUTHOR	NAME OF BOOK
Anatomy	BD Chaurasia	BD Chaurasia's Human Anatomy
	William, Peter L	Grays Anatomy
Oral Anatomy	Ash, Major M	Wheelers Dental Anatomy, Physiology and Occlosion
	Sicher, Harry, Du Brull , Llyod	Oral Anatomy
Oral Histology	Bhaskar B.N. Ed	Orbans Oral Histology and Embryology
	Avery, James K	Essentials of Oral Histology and Embryology
Embryology	Sadler	Langmans Medical Embryology
	Inderbeer Singh	Human Embryology

Physiology	Guyton Arthur and John L Hall	Text Book of Medical Physiology
	Ganong, William F	Review of Medical Pysiology
Pharmacology	KD Tripathi	Essentials of Medical Pharmachology
	Hardman, Joel G	Goodman and Gillmans pharmacological basis of Therapeutics
Nutrition	Nizel	Nutrition in Preventive Dentistry: Science and Practice
General Pathology	Cotran, Ramzi S and Others	Robbins Pathologic Basis of Disease
	Harsh Mohan	Textbook of Pathology
Oral Pathology	Shaffer, William and Others	Textbook of Oral Pathology
	Neville, Brad W and Others	Oral and Maxillofacial Pathology
Microbiology	Ananthanarayan and Panicker	Textbook of Microbiology
	Lakshman S	Essential Microbiology for Dentistry
Biostatistics	Dr. Symalan	Statistics in Medicine
	Soben Peter	Essentials of Preventive and Community Dentistry
	Sunder Rao and Richard J.	Introduction to Biostatistics and Research Methods

Orthodontics and Dentofacial Orthopaedics

1. WILLIAM R.PROFFIT, Contemporary Orthodontics
2. GRABER & VANARSDALL, Orthodontics - Current Principles &Techniques
3. MOYERS, Text Book of Orthodontics
4. GRABER, Orthodontics Principles and practice.
5. GRABER,PETROVIC,&RAKOSI Dentofacial Orthopedics with Functional Appliances
6. ATHENASIOU E ATHENASIOU, Orthodontic Cephalometry
7. JACOBSON, Radiographic Cephalometry
8. RAKOSI, An Atlas And Manual of Cephalometric Radiography
9. ENLOW, Handbook of Facial Growth
10. EPKER & FISH, Dentofaical Deformities Vol.1
11. PROFFIT & WHITE, Surgical Orthodontic Treatment
12. NANDA, Biomechanics in Clinical Orthodontics

13.NANDA & BURSTONE, Retention and Stability in Orthodontics

14. OKESON, Management of T.M. Disorders And Occlusion

15. LOU NORTON &DAVIDOWITCH, Biology of tooth movement

16. GERHARD PFIEFER, Craniofacial Abnormalities and clefts of the lip, Alveolus and Palate.

17.OKESON, TMJ Disorders.

18.Mc LAUGLIN, BENNET AND TREVESI –Systemised Orthodontic treatment mechanics

19.V .P JAYADE – Refined Begg for Modern Times

20.NANDA – Temporary anchorage devises in Orthodontics

21.VINOD KRISHNAN, Ze'eV DAVIDOVITCH – Biologic Mechanisms of Tooth Movement

22.VINOD KRISHNAN, Ze'Evdavidovitch – Integrated Clinical Orthodontics

23.WILLIAM J CLARK –Twin Block Functional Therapy – Applications in Dentofacial Orthopedics

24.FARHAD B NAINI – Facial Aesthetics : Concepts and Clinical Diagnosis

2.19 Reference books

L. JOHNSTON, New Vistas in Orthodontics LEE GRABER,

Orthodontics - State of the Art- The Essence of Science

NIKOLAI, Bio Engineering Analysis of Orthodontic Mechanics

M. RAKOSI & GRABER, A Color Atlas of Dental Medicine

BURSTONE, Modern Edgewise Mechanics and Segmented Arch Technique

W J CLARK, The Twin Block Functional Therapy

McNAMARA & BRUDON, Mixed Dentition

R D ROBLEE, Interdisciplinary Dentofacial Therapy

NANDA, The Developmental Basics of Occlusion and Malocclusion

TIMMS, Rapid Maxillary Expansion

WILLIAMS & COOKS, Fixed Orthodontic Appliances

RICKETTS, Bioprogresssive Therapy

VAN DER LINDEN, Quintessence Series

MICHIGAN CENTER, Craniofacial Growth Series for human growth and Development

SALZMAN, Practice of Orthodontics VoL II and I

ROHIT SACHDEVA, Orthodontics for the next millennium

SCHWIDLING, The Jasper Jumper

ROBERT RICKETTS, Provocations and perceptions in Craniofacial Orthopedics

PETER MILES and D RINCHUSE – Evidence Based Clinical Orthodontics

GREG HUANG and STEPHENRICHMOND – Evidence Based Orthodontics

2.20 Journals

American Journal of Orthodontics and Dentofacial Orthopedics

Journal of Orthodontics (formerly British Journal of Orthodontics)

Angle Orthodontist

Journal of Clinical Orthodontics

Journal of Indian Orthodontic Society

Seminars in Orthodontics

Journal of Orthodontics and Dentofacial Orthopedics

European Journal of Orthodontics

Australian Journal of Orthodontics

International Journal of Adult Orthodontics and Orthognathic surgery

The Functional Orthodontist.

2.21 Logbook

- **Work Diary / Log Book**

Logbooks serve as a document of the trainee's work. The trainee shall maintain this Logbook of the special procedures/operations observed/assisted/performed by him/her during the training period right from the point of entry and its authenticity shall be assessed weekly by the concerned Post Graduate Teacher / Head of the Department. This shall be made available to the Board of Examiners for their perusal at the time of his / her appearing at the Final examination. The logbook should record clinical cases seen and presented, procedures and tests performed, seminars, journal club and other presentations. Log book entries must be

qualitative and not merely quantitative, focusing on learning points and recent advances in the area and must include short review of recent literature relevant to the entry. A work diary containing all the various treatment done by the candidate in the course of the study should also be maintained. The work diary shall be scrutinized and certified by both the guide/co guide and Head of the Department and presented in the University practical/clinical examination (Format given in Annexures)

3 EXAMINATIONS

3.1 Eligibility to appear for exams

Every candidate to become eligible to appear for the **MDS examination** shall fulfill the following requirements.

Attendance

Every candidate shall have fulfilled the attendance prescribed by the University during **each academic year** of the Postgraduate course. A candidate becomes eligible for writing the University examination only after the completion of 36 months from the date of commencement of the course. The candidates should have completed the training period before the commencement of examination.

Dissertation

Approval of the dissertation is mandatory requirement for a candidate to appear for the university examinations

Library Dissertation

Submission of Library dissertation as per the regulations of DCI/ KUHS is mandatory for a candidate to appear for the university examination.

Progress and Conduct

Every candidate shall have participated in seminars, journal review meetings, symposia, conferences, case presentations, clinics and didactic lectures during each year as designed by the concerned department.

Work Diary and Logbook

Every candidate shall maintain a work diary and logbook for recording his/her participation in the training programmes conducted by the department. The work diary and logbook shall be verified and certified by the Head of the department.

The certification of satisfactory progress by the Head of the Department and Head of the Institution shall be based on checklist given in 5.1 to5.8.

- **Students should note that in case they do not complete the exercises and work allotted to them within the period prescribed, their course requirements will be considered unfulfilled.**
- **Clinical Records, Work Diaries and Logbooks should be maintained regularly and approved by the guide, duly certified by the Head of the Department.**

3.2 Schedule of Regular/Supplementary exams

The MDS examination shall be held at the end of the third academic year .The university shall conduct two examinations in a year at an interval of four to six months between two examinations. **Not more than two examinations shall be conducted in an academic year.**

3.3 Scheme of examination showing maximum marks and minimum marks

- MDS examination will consist of Written (theory), Viva Voce, and Practical / Clinical examinations.

Written Examination (Theory) : 300 Marks

Written examination shall consist of **four question papers**, each of three hours duration . Each paper shall carry 75 marks. The type of questions in the first three papers will be two long essay questions carrying 20 marks each and five short essay questions each carrying seven marks. **There will be no options in the questions in the first 3 papers. Fourth paper will be a single essay question paper which will carry an option and the candidate is to answer only one of the essays.** Questions on recent advances may be asked in any or all the papers. **The syllabus for the theory papers of the concerned specialty should cover the entire field of the subject. Though the topics assigned to the different papers are generally evaluated under designated papers, a strict division of the subject may not be possible and some overlapping of topics is inevitable. Students should be prepared to answer overlapping topics.** The theory examinations shall be held sufficiently earlier than the practical/clinical examinations so that the answer books can be assessed and evaluated before the start of the practical/clinical examination. The total marks for the theory examination shall be 300.

Practical Examination: 200 Marks

In case of practical examination, it should aim at assessing competence and skills of techniques and procedures. It should also aim at testing student's ability to make relevant and valid observations, interpretation and inference of laboratory or experimental or clinical work relating to his/her subject for undertaking independent work as a specialist. The total mark for practical/clinical examinations shall be 200.

Viva voce : 100 Marks

Viva voce examination shall aim at assessing depth of knowledge, logical reasoning, confidence and oral communication skills. The candidate may be given a topic for the pedagogy in the beginning of the clinical examination and asked to make a presentation on the topic for 8-10 minutes. The total marks shall be 100 of which 80 would be for the viva voce (20 marks/examiner) and 20 marks for the pedagogy.

3.4 Papers in each year

Paper-I- Applied anatomy, physiology, pathology, genetics, physical anthropology & dental material

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Paper-II-Diagnosis and treatment planning.
Paper-III-Clinical Orthodontics and Mechanotherapy
Paper-IV-Essay

3.5 Details of theory exams

Distribution of topics for each paper will be as follows:

Paper-I : Applied Basic Sciences: Applied anatomy, Physiology, Dental Materials, Genetics, Pathology, Physical Anthropology, Applied Research methodology, Bio-Statistics and Applied Pharmacology.

Paper II: Orthodontic history, Concepts of occlusion and esthetics, Ch ild and Adult Psychology, Etiology and classification of malocclusion, Dentofacial Anomalies, Diagnostic procedures and treatment planning in Orthodontics, Practice management in Orthodontics

PaperIII: Clinical Orthodontics

Paper IV : Essay

3.6 Model Question Papers

MDS – Orthodontics and Dentofacial Orthopedics

Paper I – Applied anatomy, Physiology, Pathology, Genetics, Physical anthropology & Dental material

Answer all questions

Max Marks 75

Time 3 hours

Long essays **(2 x 20 = 40 marks)**

1. Discuss growth rotation of the jaws and it's clinical relevance in Orthodontic treatment.

2. Discuss the effects of various medications in Orthodontics

Short essays **(5 x 7 = 35 marks)**

3. Sampling Errors
4. Aesthetic wires
5. Ricketts Growth prediction
6. Genetic Counselling
7. Calcium metabolism

Paper II – Diagnosis and treatment planning

Answer all questions

Max Marks 75

Time 3 hours

Long Essays **(2 x 20 = 40 marks)**

1. Discuss Orthodontic treatment for the "special needs"child.
2. What are the advantages of digital imaging over conventional? Enumerate the various digital imaging- methods. Describe CBCT technology.

Short essays **(5 x 7 = 35marks)**

3. Etiology of canine impaction
4. Orthodontic triage
5. Informed consent
6. COGS Analysis
7. Arch forms

Paper III – Clinical Orthodontics and Mechanotherapy

Answer all questions

Max Marks 75

Time 3 hours

Long Essays **(2 x 20 = 40 marks)**

1. Discuss the management of deep bite in Preadjusted Edgewise Appliance system.
2. Discuss the role of Orthodontist in cleft palate rehabilitation.

Short essays **(5 x 7 = 35marks)**

3. Biomechanics of incisor intrusion
4. Orthodontic treatment of diabetic patients
5. Role of Orthodontist in Obstructive sleep Apnoea
6. Dougherty's objectives of finishing and detailing
7. The Alt-RAMEC protocol

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Paper IV – ESSAY
Answer any one question

Max Marks 75
Time 3 hours

1. Discuss the impact of Orthodontic treatment on OHRQoL (Oral Health Related Quality of Life) quoting appropriate references

OR

2. Periodontally Accelerated Osteogenic Orthodontics.

3.7 Internal assessment component

Not applicable.

3.8 Details of practical/clinical exams to include Duration Marks Types of cases/ questions

Practical /Clinical Examination : 200Marks

Exercise No: 1 FunctionalCase : 50Marks

Selection of case for functional appliance with case discussion and recording of construction bite.

Fabrication and delivery of the appliance the next day with chairside viva.

Exercise No: 2 Multiband exercise 50Marks

1. III stage with auxiliary springs

OR

2. Bonding of SWA brackets and construction of suitable arch wire.

Exercise No. 3 Display of records of the treated cases along with patients (minimum of 5 cases)5 cases x 15 marks = 75Marks

(including seminars, thesis, Library dissertation, certificates of conferences, courses, paper publications etc)

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Exercise No:4-Long case discussions: 25Marks

No	Exercise	Marks allotted	Approximate time
1	Functional appliance	50	2 hours
2	III stage mechanics/ Bonding an arch wire fabrication	50	1 hour 30 min
3	Display of case records (a minimum of 5 cases to be presented with all the cases)	75	1 hour
4	Long cases	25	2 hours

Viva Voce – Total 100 (80 marks for the grand viva and 20 marks for thesis defense / pedagogy)

All examiners will conduct viva-voce conjointly on candidate's comprehension, analytical approach expression, interpretation of data and communication skills. It includes all components of course contents. It includes presentation and discussion on dissertation also.

3.9 Number of examiners needed (Internal & External) and their qualifications

There shall be at least four examiners in each branch of study. Out of four, two (50%) should be external examiners and two shall be internal examiners. The qualification and teaching experience for appointment as an examiner shall be as laid down by the DCI. The external examiners shall ordinarily be invited from another recognized University from outside the state. An external examiner may ordinarily be appointed for the same institute for not more than two years consecutively. Thereafter he may be reappointed after an interval of one year. The same set of examiners shall ordinarily be responsible for the practical and oral part of the examination.

The Head of the Department shall ordinarily be one of the examiners and the chairperson of the Board of Examinations; second internal examiner shall rotate after every two consecutive examinations if there are more than two postgraduate teachers in the department other than the Head of the department. No person who is not an active Postgraduate teacher in that subject can be appointed as Examiner. However in case of retired personnel, a teacher who satisfies the above conditions could be appointed as examiner up to one year after retirement.

For the MDS examination, if there are no two qualified internal examiners in an institute the second internal examiner can be from a neighbouring DCI and KUHS approved / recognized Dental College having PG course in the specific speciality. This examiner should be an active PG teacher in the same speciality with the qualifications and experience recommended for a teacher for postgraduate degree programme. The examination can also be conducted by one qualified internal examiner and three qualified external examiners if

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there is no qualified second internal examiner.
Reciprocal arrangement of Examiners should be discouraged, in that, the internal examiner in a subject should not accept external examinership of a college from which the external examiner is appointed in his subject in the same academic year.

3.10 Details of viva

Viva Voce :100Marks

i. Viva-Voce examination :80marks

All examiners will conduct viva-voce conjointly on candidate's comprehension, analytical approach, expression, interpretation of data and communication skills. It includes all components of course contents. It includes presentation and discussion on dissertation also.

ii. Pedagogy and thesis presentation : 10 +10 = 20marks

4.INTERNSHIP

Not applicable in PG courses

5.ANNEXURES

5.Check Lists for Monitoring: Log Book, Seminar Assessment etc.

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CHECKLISTS and LOGBOOK

5.1 :Checklist 1

Model Checklist for Evaluation of Preclinical Exercises

Name of Student: Date:

Name of the Faculty-in-charge:

Name of Exercise

Sl. No:	Items for observation during evaluation	Score
1	Quality of Exercise	
2	Ability to answer to questions	
3	Punctuality in submission of exercise	
4	TOTAL SCORE	

Performance	Score
Poor	0
Below Average	1
Average	2
Good	3
Very good	4

Signature of Faculty-in-charge

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5.2 :Checklist 2

Model Checklist for Evaluation of Journal Review / Seminar Presentation

Name of Student: Date:

Name of the Faculty/Observer:

Name of Journal / Seminar:

Sl. No:	Items for observation during evaluation	Score
1	Relevance of Topic	
2	Appropriate Cross references	
3	Completeness of Preparation	
4	Ability to respond to questions	
5	Effectiveness of Audio-visual aids used	
6	Time Scheduling	
7	Clarity of Presentation	
8	Overall performance	
9	TOTAL SCORE	

Performance	Score
Poor	0
Below Average	1
Average	2
Good	3
Very good	4

Signature of Faculty/Observer

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5.3 :Checklist 3

Model Checklist for Evaluation of Clinical Case and Clinical Work

Name of Student: Date:

Sl. No:	Items for observation during evaluation	Score
1	History	
	Elicitation	
	Completeness	
2	Examination	
	General Examination	
	Extra oral examination	
	Intraoral examination	
3	Provisional Diagnosis	
4	Investigation	
	Complete and Relevant	
	Interpretation	
5	Diagnosis	
	Ability to defend diagnosis	
6	Differential Diagnosis	
	Ability to justify differential diagnosis	
7	Treatment Plan	
	Accuracy	
	Priority order	
8	Management	
9	Overall Observation	
	Chair side manners	
	Rapport with patient	
	Maintenance of Case Record	
	Quality of Clinical Work	
	Presentation of Completed Case	
10	TOTAL SCORE	

Performance	Score
Poor	0
Below Average	1
Average	2
Good	3
Very good	4

Name of the Faculty/Observer:

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5.4 :Checklist 4

Model Checklist for Evaluation of Library Dissertation Work

Name of Student: Date:

Name of the Faculty/Guide:

Sl. No:	Items for observation during evaluation	Score
1	Interest shown in selecting topic	
2	Relevance of Topic	
3	Preparation of Proforma	
4	Appropriate review	
5	Appropriate Cross references	
6	Periodic consultation with guide	
7	Completeness of Preparation	
8	Ability to respond to questions	
9	Quality of final output	
9	TOTAL SCORE	

Performance	Score
Poor	0
Below Average	1
Average	2
Good	3
Very good	4

Signature of Faculty/Guide

5.5 :Checklist 5

Model Checklist for Evaluation of Dissertation Work

Name of Student: Date:

Name of the Faculty/Guide/Co-guide:

Sl. No:	Items for observation during evaluation	Score	Performance	Score
1	Interest shown in selecting topic		Poor	0
2	Relevance of Topic		Below Average	1
3	Preparation of Proforma		Average	2
4	Appropriate review		Good	3
5	Appropriate Cross references		Very good	4
6	Periodic consultation with guide/co- guide			
7	Depth of Analysis / Discuss			
8	Ability to respond to questions			
9	Department Presentation of findings			
10	Quality of final output			
	TOTAL SCORE			

Signature of Faculty/Guide/Co-guide

5.6 :CHECKLIST-6

CONTINUOUS EVALUATION OF DISSERTATION WORK BY GUIDE/CO-GUIDE

Name of the Trainee: Date

Name of the Faculty/Observer:

SI.No.	Items for observation during presentation	Poor 0	Below Average 1	Average 2	Good 3	Very Good 4
1.	Periodic consultation with guide / co- guide					
2.	Regular collection of case material					
3.	Depth of Analysis / Discussion					
4.	Department presentation of findings					
5.	Quality of final output					
6.	Others					
	Total score					

Signature of the guide / co-guide

5.7 :CHECKLIST -7

OVERALL ASSESSMENT SHEET

Name of the College: Date:

Name of Department:

Check List No	PARTICULARS	Name of trainee		
		First Year	Second Year	Third Year
1	Preclinical Exercises			
2.	Journal Review Presentation			
3.	Seminars			
4	Library dissertation			
5.	Clinical work			
6-	Clinical presentation			
7.	Teaching skill practice			
8.	Dissertation			
	TOTAL			

Signature of HOD **Signature of Principal**

The above overall assessment sheet used along with the logbook should form the basis for certifying satisfactory completion of course of study, in addition to the attendance requirement.

Key:

Mean score: Is the sum of all the scores of checklists 1 to 6

5.8LOGBOOK

DEPARTMENT OF ……..

MDS Programme

LOG BOOK OF

NAME…….

BIODATA OF THE CANDIDATE

EXPERIENCE BEFORE JOINING P.G. COURSE

DETAILS OF POSTING :

- **FIRST YEAR**
- **SECOND YEAR**
- **THIRD YEAR**

DETAILS OF LEAVE AVAILED

PRECLINICAL EXERCISES

LIBRARY DISSERTATION

RESEARCH WORK

PARTICIPATION IN CONFERENCES – CDE PROGRAMMES

DETAILS OF PARTICIPATION IN ACADEMIC PROGRAMME

SEMINARS /SYMPOSIA PRESENTED

JOURNAL CLUBS

TEACHING ASSIGNMENTS – UNDERGRADUATES / PARAMEDICAL.

SPECIAL DUTIES (IF ANY)

INTERNAL ASSESSMENT

DAILY ACTIVITIES RECORD (BLANK PAGES)

ONE PAGE FOR EACH MONTH X 36 PAGES

MISCELLANEOUS

SUMMARY

5.8.1.LOGBOOK-1

ACADEMIC ACTIVITIES ATTENDED

Name:

Admission Year:

College:

Date	Type of activity - Specify Seminar, Journal club, Presentation, UG teaching	Particulars

5.8.2.LOG BOOK -2

ACADEMIC PRESENTATIONS MADE BY THE TRAINEE

Name :

Admission Year:

College:

Date	Topic	Type of activity - Specify Seminar, Journal club, Presentation, UG teaching

5.8.3. LOGBOOK-3

DIAGNOSTIC AND OPERATIVE PROCEDURES PERFORMED

Name

Admission Year:

College:

Date	Name	OP No.	Procedure	Category **0,** A, PA, PI

Key:

O- WASHED UP AND OBSERVED - INITIAL 6 MONTHS OF ADMISSION

A-ASSISTED A MORE SENIOR SURGEON -1 YEAR MDS

PA - PERFORMED PROCEDURE UNDER THE DIRECT SUPERVISION OF A SENIOR SURGEON - II YEAR MDS

PI-PERFORMED INDEPENDENTLY - III YEAR MDS

REGULATIONS 2016

SYLLABUS

for Courses affiliated to the

Kerala University of Health Sciences

Thrissur 680596

Master of Dental Surgery (MDS)

Oral Pathology and Microbiology

Course Code: 246

(2016-17 Academic year onwards)

2016

2. COURSE CONTENT

2.1 Title of course:

MDS Oral Pathology and Microbiology

2.2 . Objectives of course

1. Goals

The goals of postgraduate training in various specialties are to train the BDS graduate who will:

- Practice respective specialty efficiently and effectively, backed by scientific knowledge and skill.
- Exercise empathy and a caring attitude and maintain high ethical standards.
- Continue to evince keen interest in continuing professional education in the specialty and allied specialties irrespective of whether in teaching or practice.
- Willing to share the knowledge and skills with any learner, junior or a colleague.
- To develop the faculty for critical analysis and evaluation of various concepts and views, to adopt the most rational approach.

2. Objectives

The objective is to train a candidate so as to ensure higher competence in both general and special area of interest and prepare him for a career in teaching, research and specialty practice. A candidate must achieve a high degree of clinical proficiency in the subject matter and develop competence in research and its methodology as related to the field concerned.

The above objectives are to be achieved by the time the candidate completes the course.

The objectives may be considered as under –

1. Knowledge (Cognitive Domain)
2. Skills (Psychomotor Domain)
3. Human values, ethical practice and communication abilities.

2.1. Knowledge

- Demonstrate understanding of basic sciences relevant to the specialty.
- Describe etiology, pathophysiology, principles of diagnosis and management of common problem within the specialty in adults and children.
- Identify social, economic, environmental and emotional determinants in a given case and take them into account for planning treatment.
- Recognize conditions that may be outside the area of specialty/competence and to refer them to an appropriate specialist.
- Update knowledge by self-study and attending courses, conferences and seminars relevant to specialty.

- Undertake audit; use information technology and carryout research both basic and clinical with the aim of publishing or presenting the work at various scientific gatherings.

2.2. Skills

- Take a proper clinical history, examine the patient, perform essential diagnostic procedures and order relevant tests and interpret them to come to a reasonable diagnosis about the condition.
- Acquire adequate skills and competence in performing various procedures as required in the specialty.

2.3. Human values, ethical practice and communication abilities

- Adopt ethical principles in all aspects of practice.
- Foster professional honesty and integrity.
- Deliver patient care, irrespective of social status, caste, creed, or religion of the patient.
- Develop communication skills, in particular skill to explain various options available in management and to obtain a true informed consent from the patient.
- Provide leadership and get the best out of his team in congenial working atmosphere.
- Apply high moral and ethical standards while carrying out human or animal research.
- Behumble and accept the limitations in his knowledge and skill and to ask for help from colleagues when needed.
- Respect patient's rights and privileges including patient's right to information and right to seek a second opinion.

2.3 Medium of instruction:

The medium of instruction for the course shall be English.

2.4 Course outline

This branch deals with the nature of oral diseases, their causes, processes and effects. It relates the clinical manifestation of oral diseases to the physiologic and anatomic changes associated with these diseases.

2.5 Duration

The course shall be of three years duration. All the candidates for the degree of MDS are required to pursue the recommended course for at least three academic years as full time candidates in an institution affiliated to and approved for Postgraduate studies by KUHS, observing the norms put forward by the DCI.

i. There will be no reduction for the course duration for any of the students including service candidates, diploma holders and those who have done senior house surgeoncy or equivalent research experience.

ii. No student shall be permitted to complete the course by attending more than 6 continuous years.
iii. A candidate selected for admission in a Dental College is obliged to follow the curriculum, rules and regulations as approved by the Dental Council of India and the University. Curriculum, rules or regulations are subject to changes from time to time.

2.6 Syllabus

The concept of health care counseling shall be incorporated in all relevant areas.

PAPER 1 : Applied Anatomy, Physiology, Pathology and Research Methodology

1. Applied General Anatomy

1.1.Osteology of head and neck
1.2.Muscles of mastication
1.2.1. blood supply & drainage
1.2.2.innervation
1.3.Muscles of facial expression
1.3.1. blood supply & drainage
1.3.2. innervations
1.4. Cranial nerves- 5, 7 , 9, 11.
1.5.Paranasal air sinuses
1.6.Palate
1.7.Submandibular gland
1.8.Sub lingual gland
1.9.Parotid gland
1.10.Anatomy of tongue –
1.10.1.Muscles
1.10.2.Blood and nerve supply.
1.11.TMJ
1.11.1.structure
1.11.2.movements of TMJ
1.11.3.relations
1.11.4.ankylosis
1.11.5.age changes.

2. Embryology

2.1.Development of face
2.2.Development of paranasal air sinuses
2.3.Pharyngeal apparatus
2.4.Development of tooth in detail and the age changes
2.5.Development of salivary glands

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2.6.Development of palate
2.7.Development of tongue
2.8.Congenital anomalies of face

3. Genetics applied to dentistry.
3.1.Modes of Inheritance
3.2.Chromosomal and genetic anomalies

4.Physiology

4.1.Blood and Lymph
4.1.1.Composition & functions of blood,
4.1.2.Plasma, plasma functions, Plasma proteins - Types, concentration, functions & variations, Erythrocyte: Morphology, functions and variations.
4.1.3.Erythropoiesis and factors affecting erythropoiesis
4.1.4.ESR- factors affecting, variations and significance.
4.1.5.Haemoglobin - Normal concentration, method of determination and variation in concentration, functions
4.1.6.Anaemia - Definition, classification, life span of RBC's destruction of RBC's , formation & fate of bile pigments, Jaundice -types.
4.1.6.Hemolysis and Fragility of RBC
4.1.7.Leukocytes: Classification, number, percentage, distribution morphology, properties, Functions & variation. Role of lymphocytes in immunity, life span & fate of Leukocytes.
4.1.8.Thromobocytes - Morphology, number, variations, function.
4.1.9.Haemostasis – Role of vasoconstriction, platelet plug formation in haemostasis, coagulation factors, intrinsic & extrinsic pathways of coagulation, clot retraction.
4.1.10.Fibrinolytic system.
4.1.11.Tests of haemostatic function, platelet count, clotting time, bleeding time, prothrombin time - normal values, method & variations. Anticoagulants - mechanism of action.
4.1.12.Hemorrhage
4.1.13.Bleeding disorders.
4.1.14.Blood groups: ABO & Rh system, method of determination, importance, indications & dangers of blood transfusion, blood substitutes.
4.1.15.Blood volume: Normal values, variations.
4.1.16.Functions of reticulo-endothelial system.
4.1.17.Specific gravity, Packed cell volume, Methods of estimation
4.1.18.Blood Indices - MCV, MCH, MCHC - definition, normal values, variation.
4.1.19.Leucopoiesis
4.1.20. Thrombopoiesis
4.1.21. Hydrogen ion concentration of blood.
4.1.22. Homeostasis, Fluid and Electrolyte Balance, Acid Base Balance.
4.1.23.Osmotic and Oncotic pressure.
4.1.24.Lymph – Composition and Functions – Comparison with Blood

4.2.Gastro - Intestinal Tract:

4.2.1. composition, functions and regulation of:
4.2.2. Saliva
4.2.3. Gastric juice
4.2.4. Pancreatic juice
4.2.5. Bile
4.2.6 Intestinal juice
4.2.7. Mastication
4.2.8.Deglutition

4.3.**ENDOCRINE SYSTEM:**

4.3.1.Growth hormone
4.3.2.Thyroid hormones
4.3.3.Parathyroid hormones
4.3.4.Calcium homeostasis

5.BIOCHEMISTRY

5.1.Nucleic acids

5.1.1.DNA/RNA-outline of structure
5.1.2.Transcription/translation steps of protein synthesis, inhibitors of protein synthesis, regulation of gene function

5.2.Energy Metabolism

5.2.1.Basal metabolic rate
5.2.2. Vitamins -specifically vitamin A, vitamin C, Vitamin D, Thiamin, Riboflavin, Niacin, Pyridoxine

6. General Histology

6.1.Different types of epithelium
6.2.Bone
6.3.Cellular elements of blood
6.4.Lymphatic system
6.5.Muscle
6.6.Neural tissue

7.Oral and Dental Anatomy

7.1.Morphology of individual teeth in primary dentition with variations.
7.2.Morphology of individual teeth in permanent dentition.
7.3.Anatomy of pulp canal and their variations.
7.4.Occlusion
7.5.Dental arch formation
7.6.Development of occlusion from gum pads
7.7.Deciduous, mixed and permanent dentition.
7.8.Sequence of eruption.
7.9.Age changes in the dentition.
7.10.Oral and dental developmental anomalies.
7.11.Amelogenesis imperfecta.
7.12.Dentinogenesis imperfecta.
7.13.Tooth numbering systems

8. Oral Histology

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8.1.Structure of the oral tissues.
8.2.Cytoskeleton
8.3.Cell junctions
8.4.Hard tissue formation and destruction.
8.5.Development of the tooth and its supporting tissues.
8.6.Bone
8.7.Dentinogenesis
8.8.Dentin
8.9.Pulp
8.10.Amelogenesis
8.11.Enamel structure
8.12.Cementum
8.13.Periodontium
8.14.Physiologic tooth movement
8.15.Eruption and shedding
8.16.Salivary glands
8.17.Oral mucosa
8.18.Temporomandibular joint
8.19.Repair and regeneration of dental tissue
8.20.Prenatal facial growth and development
8.21.Postnatal facial growth and development.

9.General Pathology

9.1.Introduction – pathology of the cell
9.2Cellular adaptation, cellular degeneration
9.3.Apoptosis and necrosis
9.4.Gangrene
9.5.Pathologic calcification
9.6.Intracellular accumulations – fatty changes, deposition of proteins, glycogen
9.7.Acute inflammation
9.8.Vascular events of inflammation
9.9.Cellular events of inflammation
9.10.Chronic inflammation
9.11.Mediators of inflammation
9.12.Exudate and transudate
9.13.Healing, regeneration, repair mechanisms
9.14.Wound healing.
9.15.Healing by primary intention
9.16.Healing by secondary intention
9.17.Fracture healing
9.18.Factors influencing healing process, complications
9.19.Immunological mechanisms in disease
9.20.Humoral & cellular immunity
9.21.Hypersensitivity and allergy

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9.22.Autoimmunity.
9.23.Normal water and electrolyte balance
9.24.Derangements of body fluids
9.25.Bleeding disorders
9.26.Hemorrhage and shock
9.27.Metabolic disorders – kwashiorkar, maramus
9.28.Hypervitaminosis, hypovitaminosis,
9.29.Rickets, osteomalacia.
9.30.Physical and chemical injuries.
9.31.Atrophy, hypertrophy, hyperplasia, metaplasia, dysplasia
9.32.Premalignant lesions.

10. Microbiology

10.1.Culture media.
10.2.Infection control
10.3.Sterilization and asepsis with special reference to dental office
10.4.Hand washing and hand hygiene.
10.5.Personal protective equipments.
10.6.Handling of sharp instruments.
10.7.Needle-stick injury, exposure to body fluids.
10.8.Post-exposure prophylaxis.
10.9.Management and disposal of waste.
10.10.Communicable diseases and notification.
10.11.Infection and resistance-defense mechanisms
10.12.Experimental animals & hospital infections.

11. Basic Immunology

11.1.Cellular and humoral Immunity
11.2.Antigen and Antibody System
11.3. Hypersensitivity
11.4. Autoimmune diseases.

12. Biostatistics

12.1.Introduction, definition and branches of biostatistics
12.2.Collection of data
12.3.Sampling- types
12.4.Bias and errors
12.5.Compiling data-graphs and charts
12.6.Measures of central tendency (mean, median and mode)
12.7.Standard deviation
12.8.Tests of significance (chi square test't'test and z-test)
12.9.Null hypothesis

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13.Ethics in Dentistry.

13.1.Introduction to ethics:

13.1.1. What is ethics?

13.1.2 .What are values and norms?

13.1.3 .How to form a value system in one's personal and professional life?

13.1.4 .Hippocratic oath.

13.2. Ethics of the Individual

13.2.1. The patient as a person

13.2.2. Right to be respected

13.2.3. Truth and confidentiality

13.2.4 .Autonomy of decision

13.2.5 .Doctor patient relationship

13.3. Professional Ethics

13.3.1. Code of conduct

13.3.2.Contract and confidentiality

PAPER II: Oral pathology, Microbiology and Oncology

1. 1Developmental defects of the oral and maxillofacial region. 1.2.Abnormalities of the teeth
1.3. Pulpal and periapical diseases
1.4.Bacterial infections
1.5.Fungal and protozoal diseases
1.6.Viral diseases
1.7.Physical & chemical injuries
1.8.Allergies and immunological diseases
1.9.Epithelial pathology
1.10. Salivary gland pathology
1.11. Soft tissue tumours
1.12. Heamatologic disorders
1.13. Bone pathology
1.14. Odontogenic cyst and tumours
1.15. Dermatologic diseases
1.16. Oral manifestations of systemic disease
1.17. Facial pain and neuromuscular disease
1.18. Forensic odontology
1.19. Differential diagnosis of oral and maxillofacial lesions
1.20. Oral biopsies
1.21. Oral cytology
1.22. Dental caries
1.23. Oral bacterial flora
1.24. Basic immunology and virology
1.25. Lymph node and reticulo endothelial pathology
1.26. Dermatopathology
1.27. Radiation pathology
1.28. Regressive alterations of the teeth
1.29. Spread of oral infection
1.30. Healing of oral wounds

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1.31. Oral aspects of metabolic disease
1.32. Disease of nerve and muscle
1.33. Diagnostic lab procedure

2. ORAL MICROBIOLOGY AND IMMUNOLOGY

2.1.Normal oral microbial flora
2.2.Defense mechanism of the oral cavity.
2.3.Microbiology and immunology of Dental Caries and Periodontal diseases
2.4. Dental Caries – Introduction, Epidemiology, Microbiology, cariogenic bacteria including properties, acid production in plaque, development of lesion, response of dentin-pulp unit, histopathology, Root caries, Sequelae and Immunology.
2.5.Tumor Immunology
2.6. Infections of the pulp and periodontal tissues
2.7. Oral Sepsis and Bacteremia
2.8.Microbial Genetics

3. FORENSIC ODONTOLOGY

3.1.Legal procedures like inquest, medico legal evidences, post mortem examination of violence around the head and neck region, identification of deceased individual using teeth and other oral tissues.
3.2.Bite marks, Rugae patterns and lip prints.
3.3.Saliva and its use in forensic identification.
3.4. The molecular biology of cancer
3.5. Carcinogenesis
3.6.Recent advances in oral oncology
3.7. Aetiology, epidemiology and prevention of cancer

PAPER III : Laboratory techniques and Diagnosis and Oncology

1. Principles and practice of microscopy and photo microscopy
2. Types of biopsies – principles and methods
3. Principles and techniques in routine laboratory procedures in the identification of various oral disease
4. Investigations and Lab Procedures in Forensic odontology
5. Fixation and fixatives
6. Tissue processing, microtomy and paraffin sections
7. Frozen and related sections
8. The theory of staining
9. The haematoxylin and eosin
10. Connective tissues and stains
11. Proteins and nucleic acids
12. Amyloid
13. Carbohydrates
14. Lipids
15. Pigments and minerals
16. Micro-organisms
17. Bone
18. Cytoplasmic granules, organelles and special tissues
19. Enzyme histochemistry and Immunohistochemistry
20. In-situ hybridization
21. Diagnostic cytopathology

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22. Resin embedding media
23. Electron microscopy
24. Quantification in histopathology
25. Safety in histopathology lab
26. Audit in histopathology

PAPER IV – GENERAL ESSAY
Three hour Essay pertaining to any of the speciality topics.

2.7 Total number of hours

As per the instruction given by the DCI

2.8 Branches if any with definition

Oral Pathology and Microbiology

2.9 Teaching learning methods

Method of Training

The training of a postgraduate student shall be full time but graded responsibilities in the management and treatment of patients entrusted to his/her care. The participation of the students in all facets of educational process is essential. Every candidate should take part in seminars, group discussions, case demonstrations, clinics, journal review meetings, and clinical meetings. Every candidate shall be required to participate in the teaching and training programme of undergraduate students and interns. Training should include involvement in laboratory and experimental work, and research studies. Every Institution undertaking Post Graduate training programme shall set up an Academic cell or a Curriculum Committee, under the chairmanship of a Senior faculty member, which shall work out the details of the training programme in each speciality in consultation with other Department faculty staff and also coordinate and monitor the implementation of these training Programmes.

Based on the above guidelines for a structured training programme for postgraduate courses, the basic tenets of a successful postgraduate teaching programme, are detailed under the following heads.

- **Formal Lectures** by the faculty on varied subjects including general areas and systems. Both senior and junior faculty can do this. However, the number of these classes should be maintained of low levels to encourage self-learning.
- **Symposia / Seminars** form an integral part of PG learning. A monthly symposium will generate approximate 30-35 symposia / course. These symposia can include department faculty and HODs as chairpersons and maximum involvement of both students and faculty should be ensured.
- **Clinical Discussions** form the core of PG training and can be assigned to various clinical units on rotating basis. However other faculty could also actively participate in the discussion. The discussions must be 3-4/week. One suggestion is to score the performance of the candidate by a small panel of faculty and convey the scores to the

candidate / PG at the end of the session.

- **Journal Club /Clinical Club** should be conducted at least once in a week in each postgraduate department. Journal clubs not only imparts new information but also trains the candidate to objectively assess and criticize various articles which come out and should be useful in ensuring evidence based dentistry.
- **Guest Lectures** can be integrated into the PG program at least once in a month. Even the retired faculty can be invited for delivering the lectures and will ensure importing of greater wisdom to the candidates.
- **Orientation Classes** for newcomers should also be incorporated. These classes can even be assigned to junior faculty/senior PGs.
- **Clinical posting.** Each PG student should work in the clinics on regular basis to acquire adequate professional skills and competency in managing various cases to be treated by a specialist.
- **Clinico Pathological Conferences** should be held once a year involving the faculties of Oral Medicine and Radiology, Oral Pathology and concerned clinical department. The student should be encouraged to present the clinical details, radiological and histo-pathological interpretations and participation in the discussions.
- **Rotation postings in other departments** should be worked out by each department in order to bring in more integration between the speciality and allied fields.
- **Periodical Quiz** can be both informative and entertaining and should be encouraged and planned.
- **Computer Training and Internet Applications** are now becoming a must for both faculty and students. These areas should be strengthened as a next step. There can be a sort of internet information club in the departments.
- **Conferences/CDEs** – All postgraduate students should be encouraged to attend conferences and CDEs. They should also be asked to present papers wherever appropriate and should be rewarded by assigning scores for them.
- **Publication of scientific papers** – It is desirable and advisable to have at least two publications in the State/National/International indexed dental journals.
- **Involvement in Teaching Activity** – PG students can be assigned the job of teaching the undergraduate students and these will definitely improve the teaching skills in the postgraduate students.

Examinations

Evaluation is a continuous process, which is based upon criteria developed by the concerned authorities with certain objectives to assess the performance of the learner. This also indirectly helps in the measurement of effectiveness and quality of the concerned MDS programme. Evaluation is achieved by two processes

1) Formative or internal assessment

2) Summative or university examinations.

Formative evaluation is done through a series of tests and examinations conducted periodically by the institution. Summative evaluation is done by the university through examination conducted at the end of the specified course.

A candidate registered for MDS course must clear the final examination within six years of the date of admission. The examinations should be so organized that this shall be used as the mechanism to confirm that the candidate has acquired appropriate knowledge, skill and competence at the end of the training that he/she can act as a specialist and/or

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a medical teacher as per expectation. University examination will be held regularly by KUHS in April-May/October-November every year.

A candidate who wishes to study for MDS in a second specialty should have to take the full course of 3 years in that specialty and appear for examinations.

2.10 Content of each subject in each year

Present in clause2.6

2.11 No: of hours per subject

As per the DCI guidelines

2.12 Practical training

Present in clause2.6

2.13 Records

Present in clause2.20

2.14 Dissertation: As per Dissertations Regulations of KUHS

Every candidate pursuing MDS degree course is required to carry out work on a selected research project under the guidance of a recognized postgraduate teacher. The results of such a work shall be submitted in the form of a dissertation.

The dissertation is aimed to train a postgraduate student in research methods and techniques. It includes identification of a problem, formulation of a hypothesis, search and review of literature, getting acquainted with recent advances, designing of a research study, collection of data, critical analysis, and comparison of results and drawing conclusions.

Every candidate shall submit to the University in the prescribed format a synopsis containing particulars of proposed dissertation work after obtaining ethical clearance from the Institutional Ethical Committee **within six months from the date of commencement of the course or before the dates notified by the University**. The synopsis shall be sent only through the Principal of the institution.

Such synopsis will be reviewed and the dissertation topic will be registered by the university. No change in the dissertation topic or guide/coguide shall be made without prior approval of the University. The dissertation should not be just a repetition of a previously undertaken study but it should try to explore some new aspects. The dissertation should be written under the following headings:

i. Introduction
ii. Aims and Objectives of the study
iii. Review of Literature
iv. Methodology
v. Results
vi. Discussion
vii. Conclusion

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viii. Summary
ix. References
x. Annexures

The written text of dissertation shall be not less than 50 pages and shall not exceed 150 pages excluding references, tables, questionnaires, and other annexures. It should be neatly typed (font size 13-Times New Roman or font size 13-Cambria) in 1.5 line spacing on one side of the paper (A4 size, 8.27" x 11.69") and bound properly. Spiral binding should be avoided. (Refer KUHS website). The guide, co-guide if any, Head of the Department and the Head of the Institution shall certify the dissertation.

For uniformity, it was suggested that the colour of the hard bind of the dissertation for all branches of MDS course in the purview of KUHS shall be dark brown with letters of gold colour. The title, author, and year of study should also be imprinted or embossed on the spine of the book. **Three hard copies and one properly labeled soft copy in a CD (refer KUHS website) of the dissertation thus prepared shall be submitted to KUHS on the 29th month of commencement of the course / 31st Oct. of the 3rd Academic year, whichever falls first.** Dissertation should preferably be sent to a minimum of three reviewers / examiners /assessors, of which two shall be from outside the state and one from the affiliated colleges o KUHS. If modifications are to be made as specified, three hard copies and one soft copy of the dissertation after corrections made by the candidiate should be submitted with in a minimum of 30 days to the University. Consent for acceptance for evaluation of dissertation should be obtained from the reviewer/examiner/assessor before the dissertation are despatched. Proforma for evaluation of dissertation should be sent along with the copies of the dissertation to the reviewers appointed by the university. The proforma should contain all the assessment criteria with the clause – **Accepted/Accepted with modifications/Rejected** and reasons for rejection by the examiner. This proforma should be sent back to the University within two weeks / within the date specified after receipt of dissertation. The dissertation may be declared accepted if more than 50% of the reviewers (2 in the case of 3 reviewers) have accepted it. If modifications are to be made as specified, 3 hard copies and one soft copy of the dissertation after corrections made by the candidate should be submitted within 30 days to the University which may be sent back to the same examiner/s by the University for Acceptance after a fee has been levied from the candidate. If the dissertation has been rejected by more than 50% of the reviewers (2 in the case of 3 reviewers), the dissertation may be reviewed by an Expert Reviewing Committee comprising of not less than two subject experts, Dean (Research) of KUHS and Guide of the candidate provided the Guide requests for a review, after a fee has been levied from the candidate. If rejected by the Reviewing Committee, the candidate should take up a new topic and undergo all the procedures of submitting the synopsis, fees, IEC clearance, etc as prescribed by the University. The candidate who takes up the new topic can appear only for the subsequent examination.

Approval of dissertation work is an essential precondition for a candidate to appear in the University examination. Hall tickets for the university examination should be issued to the candidate only if the dissertation has been accepted.

A candidate whose dissertation has been accepted by the examiners and approved by the University, but who is declared to have failed at the final examination will be permitted

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to reappear at the subsequent MDS examination without having to prepare a dissertation.

Guide – The academic qualification and teaching experience required for recognition by the University as a guide for dissertation work is as laid down by the Dental Council of India / KUHS.

Co-guide – A co-guide may be included provided the work requires substantial contribution from the same department or a sister department or from another institution recognized for teaching/training by KUHS/DCI. The co-guide should fulfill the academic qualification and teaching experience required for recognition by the University as a co-guide for dissertation work.

Change of Guide – In the event of a registered guide leaving the college for any reason or in the event of death of guide, guide may be changed with prior permission from the University.

2.15 Speciality training if any

Present in clause2.6

2.16 Project work to be done if any

Present in clause2.6

2.17 Any other requirements [CME, Paper Publishing etc.]

Present in clause2.6

2.18 Prescribed/recommended textbooks for each subject

Applied Basic Sciences

SUBJECT	NAME OF AUTHOR	NAME OF BOOK
Anatomy	BD Chaurasia	BD Chaurasia's Human Anatomy
	William, Peter L	Grays Anatomy
Oral Anatomy	Ash, Major M	Wheelers Dental Anatomy, Physiology and Occlosion
	Sicher, Harry, Du Brull , Llyod	Oral Anatomy
Oral Histology	Bhaskar B.N. Ed	Orbans Oral Histology and Embryology
	Avery, James K	Essentials of Oral Histology and Embryology
Embryology	Sadler	Langmans Medical Embryology
	Inderbeer Singh	Human Embryology
Physiology	Guyton Arthur and John L Hall	Text Book of Medical Physiology
	Ganong, William F	Review of Medical Pysiology
	KD Tripathi	Essentials of Medical Pharmachology

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Pharmacology	Hardman, Joel G	Goodman and Gillmans pharmacological basis of
Nutrition	Nizel	Nutrition in Preventive Dentistry:
		Science and Practice
General Pathology	Cotran, Ramzi S and Others	Robbins Pathologic Basis of Disease
	Harsh Mohan	Textbook of Pathology
Oral Pathology	Shaffer, William and Others	Textbook of Oral Pathology
	Neville, Brad W and Others	Oral and Maxillofacial Pathology
Microbiology	Ananthanarayan and Panicker	Textbook of Microbiology
	Lakshman S	Essential Microbiology for Dentistry
Biostatistics	Dr. Symalan	Statistics in Medicine
	Soben Peter	Essentials of Preventive and Community Dentistry
	Sunder Rao and Richard J.	Introduction to Biostatistics and Research Methods

Oral Pathology and Microbiology

1. **Maxillofacial Pathology**

1.1. Oral and maxillofacial pathology –2nd edition: Nevile, Bouquot,Damn

1.2. Oral medicine –10th edition Burket

1.3. Basic pathology –6th edition Kumar Cotran Robbins

1.4. Basic pathology –4th edition Harshamohan

1.5. Oral pathology —4th edition Regezi/Scuibba

1.6. Differential diagnosis of oral lesion — 4th edition Wood/GAuz

1.7. Cysts of oral region —3rd edition Mervyn Shear

1.8. Oral pathology —4th edition Shafer

1.9. Oral diseases– Cawson, Binnie, Wright

1.10. Colour atlas of oral pathology – Cawson,Odell

1.11. Syndromes of the head and neck – Gorlin

1.12. Colour atlas of oral pathology – Lee

1.13. Colour atlas of oral pathology – Eveson & Scully

1.14. Histopathology of Tumours- Enzinger & Weiss

1.15. Colour atlas of oral pathology – Ishikawa/Waldrome

1.16. Basic histopathology – Wheater

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1.17. Ham'shistology

1.18. Surgical pathology of salivaryglands– Ellis

1.19. Oxford textbook of pathology

1.20. Orofacial diseases– Scully –Porter

1.21. Histopathology of skin– Lever

1.22. Surgical pathology of mouth and jaws– Cawson/eveson

2. Oral Microbiology

2.1. Essential oral microbiology–2ndedition Samaranayake

2.2. Oral Microbiology —3rd edition Marsh Martin

2.3. Medical Microbiology – Murray/Rosenthal

2.4. Microbiology– Anathanarayanan

3. Immunology

3.1. Basic Immunology- Ivan Roitt

3.2. Essential Immunology- Ivan Roitt

4. Oncology

4.1. Pathology of tumours of the oral tissue–5thedition Lucas

4.2. Cancer – Principles and practice– deVita

4.3. Cancer biology – Ruddon

4.4. Oral cancer– Neville /Johnson

4.5. Oxford textbook of oncology

4.6. Evans histological appearance of tumours

5. Staining

5.1. Theory and practice of histological technique Bancroft

5.2. Cellular pathology technique– C.F. A.culling

5.3. Histopathologic technique– Lillie

5.4. Histological methods Kieman

5.5. Histological methods – Disbre/Rack

6. Oral Histology & Embryology

6.1. Oral Histology —5thedition Tencate

6.2. Oral Histology– Orben

6.3. Oral histology– James Avery

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6.4. Oral Histology – Inheritance and development– Vincent Provenza

6.5. Wheelers dental anatomy physiology and occlusion

6.6. Human embryology– Langman

6.7. Human embryology– Larsen

6.8. General Histology – Inderbirsingh

6.9. Gray's anatomy – 42nd edition

6.10. Scientific foundations of Dentistry– Kramer/Irvin

7. Dermatology

7.1.Rook's Textbook of Dermatology (Volume I–IV) Tony Burns

7.2.Lever's histopathology of the skin David E.Elder

2.19 Reference books

As suggested by HOD

2.20 Journals

Journal of Oral & Maxillofacial Pathology (JOMP)

Oral & Maxillofacial Pathology Journal (OMPJ)

Triple 'O' (journal of Oral pathology, Oral medicine, Oral surgery and Endodontics)

Journal of Oral Pathology and Medicine

Lancet Oncology

Oral Disease

Oral Oncology

Journal Of The National Comprehensive Cancer Network (JNCCN)

Head & Neck Oncology

Indian Journal of Cancer

Indian Journal of Pathology and Microbiology

Human Pathology

Indian Journal Of Dermatology, Venereology And Leprology

International Journal of Dermatology

American Journal of Dermatology

Histopathology

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Histochemistry

Staining Technology

Journal of Oral Biosciences

Indian Journal of Orofacial Genetics

International Journal of Oral Medical Science

Journal of Dental Research

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2.21 Logbook

- **Work Diary / Log Book**

Logbooks serve as a document of the trainee's work. The trainee shall maintain this Logbook of the special procedures/operations observed/assisted/performed by him/her during the training period right from the point of entry and its authenticity shall be assessed weekly by the concerned Post Graduate Teacher / Head of the Department. This shall be made available to the Board of Examiners for their perusal at the time of his / her appearing at the Final examination. The logbook should record clinical cases seen and presented, procedures and tests performed, seminars, journal club and other presentations. Logbook entries must be qualitative and not merely quantitative, focusing on learning points and recent advances in the area and must include short review of recent literature relevant to the entry. A work diary containing all the various treatment done by the candidate in the course of the study should also be maintained. The work diary shall be scrutinized and certified by both the guide/co guide and Head of the Department and presented in the University practical/clinical examination

3 EXAMINATIONS

3.1 Eligibility to appear for exams

Every candidate to become eligible to appear for the **MDS examination** shall fulfill the following requirements.

Attendance

Every candidate shall have fulfilled the attendance prescribed by the University during **each academic year** of the Postgraduate course. A candidate becomes eligible for writing the University examination only after the completion of 36 months from the date of commencement of the course. The candidates should have completed the training period before the commencement of examination.

Dissertation

Approval of the dissertation is a mandatory requirement for a candidate to appear for the university examination.

Library Dissertation

Submission of the library dissertation as per the regulations of DCI / KUHS is mandatory

for a candidate to appear for the university examination.

Progress and Conduct

Every candidate shall have participated in seminars, journal review meetings, symposia, conferences, case presentations, clinics and didactic lectures during each year as designed by the concerned department.

Work Diary and Logbook

Every candidate shall maintain a work diary and logbook for recording his/her participation in the training programmes conducted by the department. The work diary and logbook shall be verified and certified by the Head of the department.

The certification of satisfactory progress by the Head of the Department and Head of the Institution shall be based on checklist given in 5.1 to 5.8.

- **Students should note that in case they do not complete the exercises and work allotted to them within the period prescribed, their course requirements will be considered unfulfilled.**
- **Clinical Records, Work Diaries and Logbooks should be maintained regularly and approved by the guide, duly certified by the Head of the Department.**

3.2 Schedule of Regular/Supplementary exams

The MDS examination shall be held at the end of the third academic year. The university shall conduct two examinations in a year at an interval of four to six months between two examinations. **Not more than two examinations shall be conducted in an academic year.**

3.3 Scheme of examination showing maximum marks and minimum marks

- MDS examination will consist of Written (Theory), Viva Voce, and Practical/ Clinical examination.

Written Examination (Theory) : 300 Marks

Written examination shall consist of **four question papers**, each of three hours duration. Each paper shall carry 75 marks. The type of questions in the first three papers will be two long essay questions carrying 20 marks each and five short essay questions each carrying seven marks. **There will be no options in the questions in the first 3 papers. Fourth paper will be a single essay question paper which will carry an option and the candidate is to answer only one of the essays.** Questions on recent advances may be asked in any or all the papers. **The syllabus for the theory papers of the concerned specialty should cover the entire field of the subject. Though the topics assigned to the different papers are generally evaluated under designated papers, a strict division of the subject may not be possible and some overlapping of topics is inevitable. Students should be prepared to answer overlapping topics.** The theory examinations shall be held sufficiently earlier than the practical/clinical examinations so that the answer books can be assessed and evaluated before the start of the practical/clinical examination. The total marks for the theory examination shall be 300.

Practical Examination : 200 Marks

In case of practical examination, it should aim at assessing competence and skills of techniques and procedures. It should also aim at testing student's ability to make relevant

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and valid observations, interpretation and inference of laboratory or experimental or clinical work relating to his/her subject for undertaking independent work as a specialist. The total mark for practical/clinical examinations shall be 200.

Viva voce : 100 Marks

Viva voce examination shall aim at assessing depth of knowledge, logical reasoning, confidence and oral communication skills. The candidate may be given a topic for the pedagogy in the beginning of the clinical examination and asked to make a presentation on the topic for 8-10 minutes. The total marks shall be 100 of which 80 would be for the viva voce (20 marks/examiner) and 20 marks for the pedagogy.

3.4 Papers in each year

Paper- I- Applied Anatomy, Physiology, Pathology and Research Methodology
Paper-II- Oral pathology, Microbiology and Oncology
Paper-Ill- Laboratory Techniques and Diagnosis
Paper-IV- Essay

3.5 Details of theory exams

Distribution of topics for each paper will be as follows

PAPER-I : Applied Basic Sciences: Applied anatomy, Physiology (General and oral), Cell Biology, General Histology, Biochemistry, General Pathology, General and systemic Microbiology, Virology, Mycology, Basic Immunology, Oral Biology (oral and dental histology), Biostatistics and Research Methodology
PAPER-II: Oral pathology, Oral Microbiology & Immunology and Forensic Odontology
PAPER-III: Laboratory techniques and Diagnosis and Oncology
PAPER-IV: Essay

3.6 Model Question Papers

MDS Degree Examination – Oral Pathology

Paper I – Applied Anatomy, Physiology, Pathology and Research Methodology

(Answer all questions)

Time: 3 hrs **MaxMarks: 75**

Long essays **(2 x 20 = 40 marks)**

1. Describe the muscles of the tongue including its blood supply, lymph drainage and nerve supply (5+5+5+5=20)

2. Describe the pathway for pain. Explain the physiological basis of pain. Add a note on referred pain with suitable examples. (10+6+2+2=20)

Shor essays **(5x7=35marks)**

3. Theories on the evolutionary origin of teeth

4. Thrombosis

5. Professional ethics

6. Metabolism and role of Streptococcus mutans in dental caries

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7. Retrospective research

Paper II – Oral Pathology, Microbiology and Oncology

(Answer all questions)

Time: 3 hrs

Max Marks: 75

Long Essays **(2x20=40marks)**

1. Discuss the various grading systems of oral squamous cell carcinoma
2. Discuss odontogenic tumors of mesenchymal origin

Short Essays **(5x7=35marks)**

3. Apoptosis
4. Focal infection and focus of infection
5. Oncogenes
6. Oral candidiasis
7. Amelogenesis imperfecta

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Paper III – - Laboratory Techniques in Oral pathology, Microbiology and Diagnosis

(Answer all questions)

Long Essays **(2x20=40marks)** **Time: 3 hrs**

Max Marks: 75

1. Discuss fixatives in detail

2. Discuss the different types of hematoxylin and its uses

Short Essays **(5x7=35marks)**

3. Acid fast stain

4. Lab diagnosis of anemia

5. Confocal microscope

6. Lectins

7. Indirect immunohistochemistry

PaperIV – RECENT ADVANCES IN ORAL PATHOLOGY AND MICROBIOLOGY

(Answer any one question)

Time: 3 hrs

Max Marks: 75

1. Discuss the giant cell lesions of the oral cavity

OR

2. 2. Autoimmunity and autoimmune oral lesions

3.7 Internal assessment component

Not applicable.

3.8 Details of practical/clinical exams

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Practical Examination – 2 Days – Total 200 marks

1. Case presentation - One long Case(20marks)
   One short case (10marks)
   - Any Ulcero proliferative growth
   - Any white lesions
   - Any erythrematous lesions
   - Skin lesion with oral manifestation
2. Haematology - Any 2 investigations & discussion (20marks)
   - Hemoglobin Estimation
   - Total Count (RBC and WBC),
   - Differential Count
   - ESR
3. Cytology - (20marks)
   - Smear – Gingival / tongue, Giemsa/PAP
   - Staining and its discussion
4. HistopathologyTechniques - (30marks)
   - Staining – H & E and / special staining
   - Reporting of the stained slide
   - Viva voce on Laboratory techniques
5. Slide Discussion (100 marks) Histopathology Report Writing and Discussion of 8slides

Viva Voce: **100Marks**

i. Viva voce 80 marks

All examiners will conduct viva-voce conjointly on candidate's comprehension, analytical approach, expression, interpretation of data and communication skills on the subject.

ii. Pedagogy Exercise: 20marks

A topic will be given at the beginning of the clinical examination and will have to be presented for 8-10 minutes.

3.9 Number of examiners needed (Internal & External) and their qualifications

There shall be at least four examiners in each branch of study. Out of four, two (50%) should be external examiners and two shall be internal examiners. The qualification and teaching experience for appointment as an examiner shall be as laid down by the DCI. The external examiners shall ordinarily be invited from another recognized University from outside the state. An external examiner may ordinarily be appointed for the same institute for not more than two years consecutively. Thereafter he may be reappointed after an interval of one year. The same set of examiners shall ordinarily be responsible for the practical and oral part of the examination.

The Head of the Department shall ordinarily be one of the examiners and the chairperson of the Board of Examinations; second internal examiner shall rotate after every two consecutive examinations if there are more than two postgraduate teachers in the department other than the Head of the department. No person who is not an active Postgraduate teacher in that subject can be appointed as Examiner. However in case of retired personnel, a teacher who satisfies the above conditions could be appointed as examiner up to one year after retirement.

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For the MDS examination, if there are no two qualified internal examiners in an institute the second internal examiner can be from a neighbouring DCI and KUHS approved / recognized Dental College having PG course in the specific speciality. This examiner should be an active PG teacher in the same speciality with the qualifications and experience recommended for a teacher for postgraduate degree programme. The examination can also be conducted by one qualified internal examiner and three qualified external examiners if there is no qualified second internal examiner.

Reciprocal arrangement of Examiners should be discouraged, in that, the internal examiner in a subject should not accept external examinership of a college from which the external examiner is appointed in his subject in the same academic year.

3.10 Details of viva

Viva Voce :100Marks

i. Viva-Voce examination :80marks

All examiners will conduct viva-voce conjointly on candidate's comprehension, analytical approach, expression, interpretation of data and communication skills. It includes all components of course contents. It includes presentation and discussion on dissertation also.

ii. Pedagogy and thesis presentation : 10 +10 =20marks

4.INTERNSHIP

Not applicable for PG courses

5.ANNEXURES

5.Check Lists for Monitoring: Log Book, Seminar Assessment etc.

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CHECKLISTS and LOGBOOK

5.1Checklist 1

Model Checklist for Evaluation of Preclinical Exercises

Name of Student: Date:

Name of the Faculty-in-charge:

Name of Exercise

Sl. No:	Items for observation during evaluation	Score
1	Quality of Exercise	
2	Ability to answer to questions	
3	Punctuality in submission of exercise	
4	TOTAL SCORE	

Performance	Score
Poor	0
Below Average	1
Average	2
Good	3
Very good	4

Signature of Faculty-in-charge

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5.2:Checklist2

Model Checklist for Evaluation of Journal Review / Seminar Presentation

Name of Student: Date:

Name of the Faculty/Observer:

Name of Journal / Seminar:

Sl. No:	Items for observation during evaluation	Score
1	Relevance of Topic	
2	Appropriate Cross references	
3	Completeness of Preparation	
4	Ability to respond to questions	
5	Effectiveness of Audio-visual aids used	
6	Time Scheduling	
7	Clarity of Presentation	
8	Overall performance	
9	TOTAL SCORE	

Performance	Score
Poor	0
Below Average	1
Average	2
Good	3
Very good	4

Signature of Faculty/Observer

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5.3:Checklist3

Model Checklist for Evaluation of Clinical Case and Clinical Work

Name of Student: Date:

Sl. No:	Items for observation during	Score
1	History	
	Elicitation	
	Completeness	
2	Examination	
	General Examination	
	Extra oral examination	
	Intraoral examination	
3	Provisional Diagnosis	
4	Investigation	
	Complete and Relevant	
	Interpretation	
5	Diagnosis	
	Ability to defend diagnosis	
6	Differential Diagnosis	
	Ability to justify differential diagnosis	
7	Treatment Plan	
	Accuracy	
	Priority order	
8	Management	
9	Overall Observation	
	Chair side manners	
	Rapport with patient	
	Maintenance of Case Record	
	Quality of Clinical Work	
	Presentation of Completed Case	
10	TOTAL SCORE	

Performance	Score
Poor	0
Below Average	1
Average	2
Good	3
Very good	4

Name of the Faculty/Observer:

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5.4 :Checklist 4

Model Checklist for Evaluation of Library Dissertation Work

Name of Student: Date:

Name of the Faculty/Guide:

Sl. No:	Items for observation during evaluation	Score
1	Interest shown in selecting topic	
2	Relevance of Topic	
3	Preparation of Proforma	
4	Appropriate review	
5	Appropriate Cross references	
6	Periodic consultation with guide	
7	Completeness of Preparation	
8	Ability to respond to questions	
9	Quality of final output	
9	TOTAL SCORE	

Performance	Score
Poor	0
Below Average	1
Average	2
Good	3
Very good	4

Signature of Faculty/Guide

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5.5 :Checklist 5

Model Checklist for Evaluation of Dissertation Work

Name of Student: Date:

Name of the Faculty/Guide/Co-guide:

Sl. No:	Items for observation during evaluation	Score	Performance	Score
1	Interest shown in selecting topic		Poor	0
2	Relevance of Topic		Below Average	1
3	Preparation of Proforma		Average	2
4	Appropriate review		Good	3
5	Appropriate Cross references		Very good	4
6	Periodic consultation with guide/co- guide			
7	Depth of Analysis / Discuss			
8	Ability to respond to questions			
9	Department Presentation of findings			
10	Quality of final output			
	TOTAL SCORE			

Signature of Faculty/Guide/Co-guide

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5.6 :CHECKLIST-6

CONTINUOUS EVALUATION OF DISSERTATION WORK BY GUIDE/CO-GUIDE

Name of the Trainee: Date

Name of the Faculty/Observer:

SI.No.	Items for observation during presentation	Poor 0	Below Average 1	Average 2	Good 3	Very Good 4
1.	Periodic consultation with guide / co- guide					
2.	Regular collection of case material					
3.	Depth of Analysis / Discussion					
4.	Department presentation of findings					
5.	Quality of final output					
6.	Others					
	Total score					

Signature of the guide / co-guide

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5.7 :CHECKLIST -7

OVERALL ASSESSMENT SHEET

Name of the College: Date:

Name of Department:

Check List No	PARTICULARS	Name of trainee		
		First Year	Second Year	Third Year
1	Preclinical Exercises			
2.	Journal Review Presentation			
3.	Seminars			
4	Library dissertation			
5.	Clinical work			
6-	Clinical presentation			
7.	Teaching skill practice			
8.	Dissertation			
	TOTAL			

Signature of HOD **Signature of Principal**

The above overall assessment sheet used along with the logbook should form the basis for certifying satisfactory completion of course of study, in addition to the attendance requirement.

Key:

Mean score: Is the sum of all the scores of checklists 1 to 6

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5.8 ;LOGBOOK

DEPARTMENT OF ……..

MDS Programme

LOG BOOK OF

NAME…….

BIODATA OF THE CANDIDATE

EXPERIENCE BEFORE JOINING P.G. COURSE

DETAILS OF POSTING :

- **FIRST YEAR**
- **SECOND YEAR**
- **THIRD YEAR**

DETAILS OF LEAVEA VAILED

PRECLINICAL EXERCISES

LIBRARY DISSERTATION

RESEARCH WORK

PARTICIPATION IN CONFERENCES – CDE PROGRAMMES

DETAILS OF PARTICIPATION IN ACADEMIC PROGRAMME

SEMINARS /SYMPOSIA PRESENTED

JOURNAL CLUBS

TEACHING ASSIGNMENTS – UNDERGRADUATES / PARAMEDICAL.

SPECIAL DUTIES (IF ANY)

INTERNAL ASSESSMENT

DAILY ACTIVITIES RECORD (BLANK PAGES)

ONE PAGE FOR EACH MONTH X 36 PAGES

MISCELLANEOUS

SUMMARY

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5.8.1 :LOGBOOK-1

ACADEMIC ACTIVITIES ATTENDED

Name:

Admission Year: College:

Date	Type of activity - Specify Seminar, Journal club, Presentation, UG teaching	Particulars

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5.8.2 :LOG BOOK -2

ACADEMIC PRESENTATIONS MADE BY THE TRAINEE

Name :

Admission Year:

College:

Date	Topic	Type of activity - Specify Seminar, Journal club, Presentation, UG teaching

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5.8.3 :LOGBOOK-3

DIAGNOSTIC AND OPERATIVE PROCEDURES PERFORMED

Name

Admission Year:

College:

Date	Name	OP No.	Procedure	Category **0,** A, PA, PI

Key:

O- WASHED UP AND OBSERVED - INITIAL 6 MONTHS OF ADMISSION

A-ASSISTED A MORE SENIOR SURGEON -1 YEAR MDS

PA - PERFORMED PROCEDURE UNDER THE DIRECT SUPERVISION OF A SENIOR SURGEON - II YEAR MDS

PI-PERFORMED INDEPENDENTLY - III YEAR MDS

REGULATIONS 2016

SYLLABUS

for Courses affiliated to the

Kerala University of Health Sciences

Thrissur 680596

Master of Dental Surgery (MDS)

Pedodontics and Preventive Dentistry

Course Code:247

(2016-17 Academic year onwards)

2016

2. COURSE CONTENT

2.1 Title of course:

MDS Pedodontics and Preventive Dentistry

2.2 Objectives of course

1. Goals

The goals of postgraduate training in various specialities are to train the BDS graduate who will:

- Practice respective specialty efficiently and effectively, backed by scientific knowledge and skill.
- Exercise empathy and a caring attitude and maintain high ethical standards.
- Continue to evince keen interest in continuing professional education in the specialty and allied specialties irrespective of whether in teaching or practice.
- Willing to share the knowledge and skills with any learner, junior or a colleague.
- To develop the faculty for critical analysis and evaluation of various concepts and views, to adopt the most rational approach.

2. Objectives

The objective is to train a candidate so as to ensure higher competence in both general and special area of interest and prepare him for a career in teaching, research and specialty practice. A candidate must achieve a high degree of clinical proficiency in the subject matter and develop competence in research and its methodology as related to the field concerned.

The above objectives are to be achieved by the time the candidate completes the course. The objectives may be considered as under –

1. Knowledge (Cognitive Domain)
2. Skills (Psychomotor Domain)
3. Human values, ethical practice and communication abilities.

2.1. Knowledge

- Demonstrate understanding of basic sciences relevant to the specialty.
- Describe etiology, pathophysiology, principles of diagnosis and management of common problem within the specialty in adults and children.
- Identify social, economic, environmental and emotional determinants in a given case and take them into account for planning treatment.
- Recognize conditions that may be outside the area of specialty/competence and to refer them to an appropriate specialist.

- Update knowledge by self-study and by attending courses, conferences and seminars relevant to specialty.
- Undertake audit; use information technology and carryout research both basic and clinical with the aim of publishing or presenting the work at various scientific gatherings.

2.2. Skills

- Take a proper clinical history, examine the patient, perform essential diagnostic procedures and order relevant tests and interpret them to come to a reasonable diagnosis about the condition.
- Acquire adequate skills and competence in performing various procedures as required in the specialty.

2.3. Human values, ethical practice and communication abilities

- Adopt ethical principles in all aspects of practice.
- Foster professional honesty and integrity.
- Deliver patient care, irrespective of social status, caste, creed, or religion of the patient.
- Develop communication skills, in particular skill to explain various options available in management and to obtain a true informed consent from the patient.
- Provide leadership and get the best out of his team in congenial working atmosphere.
- Apply high moral and ethical standards while carrying out human or animal research.
- Be humble and accept the limitations in his knowledge and skill and to ask for help from colleagues when needed.
- Respect patient's rights and privileges including patient's right to information and right to seek a second opinion.

2.3 Medium of instruction:

The medium of instruction for the course shall be English.

2.4 Course outline

Pedodontics, also known as Pediatric Dentistry, is an age-defined specialty that provides both primary and comprehensive preventive and therapeutic oral health care for infants and children through adolescence, including those with special health care needs.

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2.5 Duration

The course shall be of **three years** duration. All the candidates for the degree of MDS are required to pursue the recommended course for at least three academic years as full time candidates in an institution affiliated to and approved for Postgraduate studies by KUHS, observing the norms put forward by the DCI.

i. There will be no reduction for the course duration for any of the students including service candidates, diploma holders and those who have done senior house surgeoncy or equivalent research experience.
ii. No student shall be permitted to complete the course by attending more than 6 continuous years.
iii. A candidate selected for admission in a Dental College is obliged to follow the curriculum, rules and regulations as approved by the Dental Council of India and the University. Curriculum, rules or regulations are subject to changes from time to time.

2.6 Syllabus

The syllabus for the theory of the specialty of Pedodontics should cover the entire field of the subject and the following topics may be used as guidelines.

The concept of health care counseling shall be incorporated in all relevant areas.

1. **Growth and Development:** Prenatal and Postnatal development of cranium, face, jaws, teeth and supporting structures. Chronology of dental development and development of occlusion. Dimensional changes in dental arches. Cephalometric evaluation of growth. Eruption and Exfoliation of teeth.
2. **Child Psychology:** Development and classification of behaviour, personality, intelligence in children, theories of child psychology, stages of psychological child development, fear anxiety, apprehension and its management.
3. **Behaviour Management:** Non-pharmacological and Pharmacological methods. Conscious Sedation, Deep Sedation and General Anaesthesia in Pediatric Dentistry. Including other drugs, Synergistic and Antagonistic actions of various drugs used in children.
4. Child Abuse and Neglect.
5. **Preventive Pedodontics**: Concepts, chairside preventive measures for dental diseases, high-risk caries including rampant and extensive caries – Recognition, features and Preventive Management, Pit and Fissure Sealants, Oral Hygiene measures, correlation of brushing with dental caries and periodontal diseases. Diet and Nutrition as related to dental caries. Diet Counseling.
6. **Dental Plaque**: Definition, Initiation, Pathogenesis, Biochemistry, Morphology and Metabolism.

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7. **Microbiology and Immunology as related to oral diseases in children**: Basic concepts, Immune system in human body, Autoimmune diseases, Histopathology, Pathogenesis, Immunology of Dental caries, Periodontal diseases, Tumours, Oral mucosal lesions, etc.
8. **Gingival and Periodontal Diseases in children**:
   8.1. Normal Gingiva and Periodontium in children.
   8.2. Gingival and Periodontal Diseases – Etiology, Pathogenesis, Prevention and Management.
9. **Pediatric Conservative Dentistry**:
   9.1. Principles of Pediatric Operative Dentistry along with modifications of materials – past, current and advances including tooth coloured materials.
   9.2. Modifications required for cavity preparation in primary and young permanent teeth.
   9.3. Various isolation techniques.
   9.4. Restorations of decayed primary, young permanent and permanent teeth in children using various restorative materials like Glass Ionomer, Composites, Compomers, Silver amalgam and latest restorative materials.
   9.5. Basic and advanced knowledge about dentin bonding system and bonded restorations.
   9.6. Stainless steel, polycarbonate and Resin crowns/veneers and full metal crowns.
10. **Pediatric Endodontics**:
   10.1. Primary dentition – Diagnosis of Pulpal Diseases and their management – Pulp capping, Pulpotomy, Pulpectomy, Controversies and recent concepts.
   10.2. Young Permanent Teeth and Permanent Teeth – Pulp Capping, Pulpotomy, Apexogenesis, Apexification, Concepts, Techniques and Materials used for different procedures.
   10.3. Recent advances in Pediatric Endodontics.
11. Prosthodontic considerations in Pediatric Dentistry.
12. **Traumatic Injuries in Children**:
   12.1. Classifications and Importance.
   12.2. Sequelae and reaction of teeth to trauma.
   12.3. Management of Traumatised teeth with latest concepts.
13. **Preventive and Interceptive Orthodontics:**
   13.1. Concepts of occlusion and esthetics: Structure and Function of all anatomic components of occlusion, mechanics of articulations, recording of masticatory functions, diagnosis of occlusal dysfunction, relationship of TMJ anatomy and pathology and related neuromuscular physiology.

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13.2. A comprehensive review of the local and systemic factors in the causation of malocclusion.

13.3. Recognition and management of normal and abnormal developmental occlusions in primary, mixed and permanent dentitions in children (Occlusal Guidance).

13.4. Space Management – Etiology, Diagnosis of space problems, Analysis, Biomechanics, Space Maintenance and maintainers, Serial Extraction.

13.5. Biology of Tooth Movement, Physiologic Tooth resorption and exfoliation, Eruption – A comprehensive review of the principles of teeth movements, exfoliation, eruption of teeth. Review of contemporary literature. Histopathology of bone and periodontal ligament, molecular and ultra cellular consideration in tooth movement, physiologic tooth resorption and eruption.

13.6. Myofunctional appliances – Basic principles, Contemporary appliances; Design and Fabrication.

13.7. Removable Appliances - Basic principles, Contemporary appliances; Design and Fabrication.

13.8. Case selection and diagnosis in interceptive orthodontics – Cephalometrics, Image processing, Tracing, Radiation hygiene, Video Imaging and advanced cephalometric techniques.

14. Oral Habits in Children:

14.1. Definition, etiology and classification.

14.2. Diagnosis, clinical features and dentoalveolar effects of Digit Sucking, Tongue Thrusting, Mouth Breathing and various other oral habits.

14.3. Management of oral habits in children.

15. Dental Care of Children with Special Needs: Definition, Behavioural, Clinical Features and Management of Children with

15.1. Physically Handicapping Conditions.

15.2. Mentally Compromising Conditions.

15.3. Medically Compromising Conditions.

15.4. Genetic Disorders.

16. Oral Manifestations of Systemic Conditions in Children and their management.

17. Cross infection control in dental clinic/laboratory.

18. Methods of sterilization and asepsis in clinics.

19. Management of Minor Oral Surgical Procedures in Children.

20. Dental Radiology as related to Pediatric Dentistry.

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21. Cariology:

21.1. Historical Background

21.2. Definition, Etiology and Pathogenesis.

21.3. Caries pattern in Primary, Young Permanent and Permanent teeth in Children.

21.4. Rampant Caries, Early Childhood Caries and Extensive Caries – Definition, etiology, pathogenesis, Clinical features, Complications and Management.

21.5. Role of Diet and Nutrition in Dental Caries.

21.6. Cariogenecity of various foods.

21.7. Dietary modifications and Diet Counseling.

21.8. Caries Activity Tests, Caries Prediction, Caries Susceptibility Tests and their clinical applications.

22. Pediatric Oral Medicine and Clinical Pathology: Recognition and Management of Developmental Dental Anomalies, Teething Disorders, Stomatological conditions, Mucosal Lesions, Oral Infections, etc.

23. Congenital Abnormalities in Children: Definition, Classification, Clinical features and management.

24. Dental Emergencies in Children and their Management.

25. Dental Materials used in Pediatric Dentistry.

26. Preventive Dentistry:

26.1. Definition

26.2. Levels of Prevention.

26.3. Different preventive measures used in Pediatric Dentistry including Pit and Fissure Sealants and Caries Vaccine.

26.4. Role of fluorides

26.5. Diet Counseling.

27. Dental Health Education and School Dental Health Programmes: Dental Health Concepts, Effects of Civilization and Environment, Dental Health Delivery System, Dental Health Surveys, Public Health measures related to children along with principles of children's Preventive Dentistry.

28. School Dental Health programmes – Incremental and Comprehensive Care.

29. National Oral health Policy.

30. Epidemiology of oral Diseases – Dental Caries, Gingival and periodontal diseases, malocclusion, dental fluorosis.

31. Oral Survey Procedures

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31.1. Planning

31.2. Implementation

31.3. WHO Basic Oral health methods.

31.4. Indices for oral diseases.

32. Fluorides:

32.1. Historical background.

32.2. Systemic and Topical Fluorides.

32.3. Mechanism of Action.

32.4. Toxicity and Management.

32.5. Defluoridation techniques.

33. Medicolegal aspects in pediatric Dentistry with emphasis on informed consent.

34. Case History Recording: Outline of Principles of Examination, Diagnosis and Treatment Planning.

35. Epidemiology:

35.1. Concepts

35.2. Methods of Recording and Evaluation of various oral diseases.

35.3. Various National and Global trends of epidemiology of oral diseases.

36. Comprehensive Infant Oral Health Care.

37. Comprehensive cleft lip and palate care management with emphasis on counseling, feeding remodeling, speech rehabilitation.

38. Principles of Biostatistics, Research Methodology, Understanding of Computers and Photography.

39. Setting up of Pedodontic and Preventive Dentistry Clinic.

40. Emerging concepts in Pediatric Dentistry on scope of LASERS

41. Minimal Invasive Dentistry

42. Nanodentistry in Pediatric Dentistry.

43. Evidence Based Dentistry.

44. Genetics and Molecular Biology

45. Biomimetics and Smart Materials.

46. Tooth Banking

47. Implantology – Basic Principles.

48. Hospital based dentistry.

49. Changing Trends in Oral Diseases in Children.

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TEACHING LEARNING ACTIVITIES

1. Seminars

During a 1 hour weekly seminar the student is required to review the assigned topic completely and present it in a compiled manner. Each seminar should be followed by an elaborate discussion to facilitate a complete learning. At the end of each seminar a detailed evaluation has to be carried out by each of the attending faculty and signed by the respective guide.

1.1. The topics for Basic Science seminars include

1.1.1. Evolution of jaws and teeth

1.1.2. Eruption and Shedding of Teeth,

1.1.3. Theories of Eruption

1.1.4. TM Joint

1.1.5. Haemostasis

1.1.6. Bleeding disorders

1.1.7. Regulation of Blood Calcium level.

1.1.8. Physiology of pain

1.1.9. Pain Pathway

1.1.10. Cranial Nerves

1.1.11. Pedologic Anatomy

1.1.12. Enamel, Dentine and Pulp.

1.1.13. Blood supply of head and neck.

1.1.14. Lymphatic drainage.

1.1.15. Oral Mucosa

1.1.16. Saliva.

1.1.17. Shock

1.1.18. Fear and its management.

1.1.19. Caries susceptibility and Caries Activity.

1.1.20. Syncope and its management.

1.1.21. Complications of LA.

1.1.22. Drug related emergencies.

1.1.23. Infection Control.

1.1.24. Prenatal growth and Development.

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1.1.25. Postnatal growth and development.

1.1.26. Muscles of facial expression.

1.1.27. Biostatistics.

1.1.28. Aesthetic Restorations.

1.1.29. Amalgam and Amalgam controversies.

1.1.30. Theories of Child Psychology.

1.1.31. Anxiety rating scales.

1.1.32. Balanced diet.

1.1.33. Ethics In research.

1.1.34. Dental Health Survey.

1.1.35. Drug dosing.

1.1.36. Inferential Statistics.

1.1.37. Intraoral Radiographs.

1.1.38. Radiographic hazards.

1.1.39. Normal radiographic anatomy of the jaws and its structures.

1.1.40. Digital imaging.

1.1.41. CBCT in pediatric dentistry.

1.1.42. Bleeding disorders.

1.1.43. Pediatric Oral Pathology.

1.1.44. Developmental anomalies of the face.

1.1.45. Developmental anomalies of the jaws.

1.1.46. Biomedical waste management.

1.1.47. Healing and Repair.

1.1.48. Pulp and Pulpal Diseases.

1.1.49. Antibiotics in Pediatric Dentistry.

1.1.50. Analgesics in Pediatric Dentistry.

1.2. Basic and Advanced Speciality Seminars.

The topics for Basic Speciality and Advanced Speciality seminars include

1.2.1. Growth and Development

1.2.1.1. Basic concepts of growth and development of face (pattern variability, timing of growth influenced by various hereditary and environmental factors).

1.2.1.2. Principles and theories.

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1.2.1.3. Cephalometric growth evaluation.

1.2.1.4. Human dentition, its development and changing patterns.

1.2.1.5. Normal occlusion and factors influencing functional development of occlusion.

1.2.1.6. Principles and practice of diagnosis of incipient malocclusion.

1.2.2. Child Psychology

1.2.2.1. Emotional development of the child and its scope in Pediatric Dentistry.

1.2.2.2. Concept of different theories of child psychology.

1.2.2.3. The origin and characteristics of fear, anxiety and phobia.

1.2.2.4. Psychometric measures of dental fear, anxiety and phobia.

1.2.2.5. Behavioural Sciences and its application in Pediatric dentistry.

1.2.2.6. Ephebodontics.

1.2.3. Orodental diseases in Children

1.2.3.1. Indian and global prevalence of dental diseases and its changing trends.

1.2.3.2. Recent concepts of dental plaque.

1.2.3.3. Dental Caries and its recent concepts.

1.2.3.4. Principles and diagnosis of dental caries.

1.2.3.5. Management of high risk dental caries child.

1.2.3.6. Common periodontal diseases in children and their management.

1.2.3.7. Strategies for prevention of dental caries and periodontal diseases in children.

1.2.3.8. Caries vaccine.

1.2.4. Pediatric Operative Dentistry

1.2.4.1. Basis for pediatric restorative dentistry – how it differs from adult dentistry.

1.2.4.2. New era in conservative dentistry

1.2.4.2.1. Recent concept.

1.2.4.2.2. Aesthetic Dentistry

1.2.4.2.3. Recent trends in restorative materials for children.

1.2.4.2.4. Enamel hypoplasia and it management.

1.2.4.3. Rubber dam – facilitation for excellence.

1.2.4.4. Traumatized teeth and its management in children.

1.2.5. Pediatric Endodontics

1.2.5.1. Pulp and its pathophysiology.

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1.2.5.2. Biological approach to pulp therapy.

1.2.5.3. Diagnosis and differential diagnosis including latest diagnostic aids.

1.2.5.4. Management using various recent materials.

1.2.6. Radiology in Pediatric Dentistry

1.2.6.1. Its scope in pediatric dentistry.

1.2.6.2. Digital radiography.

1.2.6.3. Lasers in dentistry.

1.2.7. Preventive and Interceptive Orthodontics

1.2.7.1. Preventive and Interceptive Orthodontics: Diagnosis and Significance in Pediatric Dentistry.

1.2.7.2. Pernicious oral habits, their prevention and management in children.

1.2.7.3. Interceptive procedures for the integrity of arch perimeter.

1.2.7.4. Functional jaw orthopedics in Pediatric Dentistry.

1.2.8. Preventive Dentistry

1.2.8.1. Principles of Epidemiology.

1.2.8.2. Various indices used for recording the dental and oral diseases in children.

1.2.8.3. Measures used for prevention and maintenance of oral and dental diseases in children.

1.2.8.4. Fluorides in dentistry.

1.2.8.5. Present Scenario of fluorides in various countries throughout the world.

1.2.8.6. Diet and its implication on oro-dental health.

1.2.8.7. Occlusal Sealants.

1.2.9. Special care Children

1.2.9.1. Differently abled Children – The concept of Attitude.

1.2.9.2. Hospital Dentistry for Medically compromised children.

1.2.9.3. Child with cleft lip and Palate.

1.2.9.4. Comprehensive preventive oral health care for differently abled children.

1.2.10. Pediatric Prosthodontics

1.2.10.1. Edentulous child and implications on the stomatognathic system.

1.2.10.2. Semi permanent restorations.

1.2.10.3. Prosthodontic rehabilitation of the child with cleft palate.

1.2.11. Pediatric Consideration in Oral Surgery.

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First Year

PRECLINICAL EXERCISES

Apart from the didactic components, the following is the minimum preclinical exercises required to be completed in the first six months of commencement of the course.

1. Carving of all deciduous and permanent teeth.
2. Basic wire bending exercises.
   - 2.1. Straightening of 6" long 19G SS wire.
   - 2.2. Square of 1'' side, Triangle of 1" side, Circle of 2"diameter.
   - 2.3. Clasps – 1 pair each
     - 2.3.1.¾ clasp
     - 2.3.2.Full Clasp
     - 2.3.3.Triangular clasp
     - 2.3.4.Adam'sclasp
     - 2.3.5.Modified Adam's clasp
     - 2.3.6.Duyzing's clasp
     - 2.3.7.Ball clasp
   - 2.4. Labial bows
     - 2.4.1.Short
     - 2.4.2.Long
     - 2.4.3.Robert's Retractor
     - 2.4.4.Fitted
     - 2.4.5.With reverse loop
     - 2.4.6.High with apron springs
     - 2.4.7.Mills retractor
     - 2.4.8.Split
   - 2.5. Springs
     - 2.5.1. Single cantilever
     - 2.5.2.Double cantilever
     - 2.5.3.Palatal canine retractor
     - 2.5.4.U-loop canine retractor
     - 2.5.5. Self-supporting canine retractor

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2.5.6. Helical canine retractor

2.5.7. Bilateral acting finger spring

2.5.8. T spring

2.5.9. Coffin Spring

2.5.10. De-rotating spring

2.6. Basic Soldering exercises

2.6.1. Ladder – 5" long with 4 rungs 1" long and 1" apart.

2.6.2. Christmas Tree – 5" long with branches 1"apart.

2.7. Fabrication of:

2.7.1 Maxillary bite Plate / Hawleys'

2.7.2 Maxillary expansion screw appliance.

2.7.3 Canine retractor appliance.

2.8 All habit breaking appliances.

2.8.1 Removable type.

2.8.2 Fixed type.

2.8.3 Partially fixed and removable.

2.9 Three myofunctional appliances should include a Functional Regulator and Twin Block.

2.10 Making of inclined plane appliance.

2.10.1 Acrylic inclined plane

2.10.2 Stainless steel band inclined plate

3 Fabrication of space maintainers:

3.1 Removable type. – Functional and nonfunctional

3.2 Fixed type – Band and loop, Transpalatal, Nance Arch holding device, Lingual arch.

3.3 Fixed Space Regainer

3.4 Removable space regainer

3.5 For guiding the eruption of first permanent molar.

3.6 Fixed Functional space maintainer.

4 Basic spot welding exercises.

5 Collection of extracted deciduous and permanent teeth.

5.1 Sectioning of teeth at various levels and planes.

5.2 Drawing of sections and shapes of pulp.

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5.3 Performing ideal cavity preparation for various restorative materials for both deciduous and permanent teeth.

5.4 Fabrication of various temporary and permanent restorations on fractured anterior teeth.

5.5 Performing Pulpotomy, Pulpectomy, root canal treatment and Apexification procedures.

5.6 Preparation of teeth for stainless steel crowns and full crowns.

5.7 Preparation of teeth for various types of crowns

5.8 Laminates/veneers

5.9 Bonding & banding exercise

6 Performing of behavioral rating and I.Q. tests for children.

7 Computation of:

7.1 Caries index and performing various caries activity tests.

7.2 Oral Hygiene Index.

7.3 Periodontal Index.

7.4 Fluorosis Index

8 Radiographs

8.1 Taking of periapical, occlusal, bitewing radiographs of children.

8.2 Developing and processing of films thus obtained.

8.3 Cephalometric Radiographs – Tracing of soft tissues, dental and skeletal landmarks as observed on these radiographs, drawing of various planes and angles and profile studies at 3, 7, 11 and 14 years.

9 Performing Mixed Dentition Analysis and other prediction methods.

10 Setting of Teeth – Deciduous, Mixed and Permanent Dentition.

11 Fabrication of Special Trays, Feeding Plate, Screw Gag.

12 Models of ideal occlusion - Deciduous and Mixed dentition.

13 Library Dissertation– Topic for the library dissertation should be finalized and approved at the end of the first six months and two copies to be submitted to the Head of the Department at the end of the first year.

14 Drawing Album – To be submitted to the Head of the Department at the end of the first year.

14.1 Table showing chronology of eruption of teeth.

14.2 Table showing tooth dimensions.

14.3 Table showing differences between primary, young permanent and permanent teeth.

14.4 Diagrams of Tooth Morphology – Deciduous and Permanent teeth.

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14.5 Diagrams of Pulp morphology– Deciduous and Permanent teeth.

14.6 Diagrams of Development of Dentition at different ages.

14.7 Diagrams of Development of Occlusion at different ages.

14.8 Isolation of teeth – Rubber Dam – Armamentarium and techniques.

14.9 Modification of cavity preparation in deciduous teeth.

14.10 Mixed Dentition Analysis – Principles and measurements.

14.11 Principles of Brazing, soldering and Welding.

14.12 Diagram showing cephalometric points, planes and angles.

14.13 Behaviour Rating Scales

14.14 Dental Anxiety rating scales.

14.15 Caries Index – DMF index and its variants.

15 Records of the Preclinical exercises to be approved by the guide and duly certified by the Head of the Department. Preclinical exercises to be displayed for the MDS final examination.

16 Start of dissertation.

17 Applied Professional Experience

17.1 Pediatrics – 1week

17.2 Child Development Centre – 1week

The student should participate in Hospital pediatric rounds, clinics and seminars. They should also learn to perform the routine physical examination on a child, as well as gain knowledge about normal developmental milestones, reflexes, immunization schedule, infant health care, differentiate between normal and abnormally developed child and discuss the general principles of medical care for acutely and chronically sick children as well as children with chromosomal syndromes.

17.3 Dental Radiology – 1week

17.4 Oral Pathology – 1week

18 Special Assignments

18.1 School Dental Health Programme –1

18.2 Dental Camp-1

18.3 Practical application of Preventive dentistry concepts in a class of 35-50 children and Dental Health Education and Motivation. -2

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19 **Mini Project** – In the form of an epidemiological survey – Recording of any dental diseases on at least 100 children, computation of results and submission of report or a KAP study on any topic relevant to pediatric dentistry.

Second Year

1. This part of the programme focuses on providing the candidate with a further broad outline of theoretical, clinical and practical courses in Basic Pediatric and Preventive Dentistry.

2. Applied Professional Experience(APEX)

2.1. Anesthesia and Pediatric Surgery – 2weeks

Training in general anesthesia, training in i.v., i.m., s.c. injections, learn to intubate a patient and monitor the patient's vital signs during GA., participate in seminars, pre and postoperative rounds.

2.2. Plastic Surgery – 2weeks.

Training in basic principles and their application especially in comprehensive management of cleft lip and palate and other oral and maxillofacial anomalies with special emphasis on the role of Pediatric Dentist in the multidisciplinary team.

2.3. Trauma Centre Posting / Oral and Maxillofacial Surgery – 2weeks

Learn to attend emergency calls with the principles of primary management.

3. Special Assignments

3.1. School Dental Health Programme –1

3.2. Dental Camp-1

3.3. Practical application of Preventive dentistry concepts in a class of 35-50 children & Dental Health Education & Motivation -4

Third Year

1. This part of the programme focuses on providing the candidate with a further broad outline of theoretical, clinical and practical courses in Advanced Clinical Pediatric and Preventive Dentistry.

CLINICAL REQUIREMENTS

The following is the minimum required quota to be completed before the candidate can be considered eligible to appear in the MDS Examination.

1. Behaviour management of different age group children with complete records. -17

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2. Detailed case evaluation with complete records, treatment planning and presentation of cases with chairside discussion. -17

3. Step by step chairside preventive dentistry scheduled for high risk children with gingival and periodontal diseases and Dental Caries. -11

4. Practical Application of Preventive Dentistry concepts in a class of 35-50 children and Dental health Education and Motivation. -7

5. Pediatric Conservative Dentistry with application of recent concepts.

5.1. Management of Dental Caries

5.1.1.Occlusal Caries - 50

5.1.2.Proximal Caries - 100

5.1.3.Other Surfaces - 100

5.2. Management of Traumatised Anterior teeth - 15

5.3. Aesthetic Anterior Restorations - 25

6. Pediatric Endodontic Procedures

6.1. Deciduous Teeth

6.1.1.Pulpotomy - 50

6.1.2.Pulpectomy - 100

6.2. Permanent Teeth

6.2.1.Posterior RCT - 20

6.2.2.Anterior RCT - 15

6.2.3.Apexification and Apexogenesis - 20

7. Stainless Steel Crowns - 50

8. Other Crowns - 20

9. Orthodontic Appliances

9.1. Fixed Space Maintainers - 20

9.2. Fixed Habit Breakers - 10

9.3. Removable Space Maintainers - 15

9.4. Removable Habit Breakers - 15

9.5. Removable appliance for correction of minor orthodontic problems - 15

9.6. Semi Fixed - 5

9.7. Myofunctional Appliances, including

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Twin Block and Functional Regulator - 5

9.8. Fixed Appliance Therapy in selected cases in Children - 2

10. **Management of Cleft lip/palate patients**

Prosthetic Rehabilitation

10.1. Partial Dentures - 10

10.2. Feeding Plates - 10

10.3. Obturators - 10

11. **Surgical Management** of Cysts of Dental Origin, Supernumerary teeth and Odontomes.

12. **Other Minor Surgical Procedures** like Apicoectomy, Frenotomy, Frenectomy, Gingivectomy, Surgical Exposure of Teeth

13. **Management of Fracture of the Jaws.**

14. **Comprehensive dental management** of the physically impaired, mentally compromised and medically compromised children.

15. **Preventive measures** like Fluoride Applications, Pit and Fissure sealant applications with complete follow up and diet counseling.

16. **Rotation Postings in other Departments:** It is mandatory that the students are posted on rotation in the following departments.

16.1. Pediatrics – 1week

16.2. Child Development Centre – 1week

16.3. Dental Radiology – 1week

16.4. Oral Pathology – 1week

16.5. Anesthesia and Pediatric Surgery – 2weeks

16.6. Plastic Surgery – 2weeks.

16.7. Trauma Centre Posting / Oral and Maxillofacial Surgery – 2weeks

17. **Special Assignments**

17.1. School Dental Health Programmes - 3

17.2. Dental Camps - 2

18. **Library Dissertation**: Topic for the library dissertation should be finalized and approved by the end of the first six months and the same to be submitted at the end of the first year. It should be approved by the guide and certified by the Head of the Department.

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19. **Conferences and Publication of Scientific Paper:** During the MDS course the student should **attend two National Conferences** and attempts should be made to **present at least two scientific papers** and **publish at least two scientific articles** in an indexed journal relevant to the specialty.

20. **Clinical work Requirements from 7to36months**

The following is the minimum clinical requirement to be completed before the candidate can be considered eligible to appear in the final M.D.S Examinations: -

No.	Clinical Work	Total	7 to 12 Months	13 to 24 Months	25 to 34 Months
1.	Behavior Management of different age groups children with complete records.	17	2	10	5
2.	Detailed Case evaluation with complete records, treatment planning and presentation of cases with chair side and discussion	17	2	10	5
3.	Step-by-step chair side preventive dentistry scheduled for high risk children with gingival and periodontal diseases & Dental Caries	11	1	5	5
4.	Practical application of Preventive dentistry concepts in a class of 35-50 children & Dental Health Education & Motivation.	7	1	4	2
5.	Pediatric Operative Dentistry with application of recent concepts (a). Management of Dental Caries (I) Class I (II) ClassII (III) Other Restorations	 50 100 100	 30 40 20	 10 50 50	 10 10 30
6.	(b). Management of traumatized anterior teeth	15	04	06	05
7.	(c) Aesthetic Restorations	25	05	10	10
8.	(d). Pediatric Endodontic Procedures- Deciduous teeth				

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	Pulpotomy Pulpectomy	50 100	10 20	15 30	25 50
	Permanent Molars-	20	03	07	10
	Permanent Incisor-	15	2	3	10
	Apexification & Apexogenesis	20	02	08	10
9.	Stainless Steel Crowns	50	10	20	20
10	Other Crowns	20	05	05	10
11	Fixed Space Maintainers Habit Breaking appliance	30	08	12	10
12	Removable Space Maintainers Habit Breaking Appliance	30	08	12	10
13	Functional Appliances	05	01	02	02
14	Preventive measures like fluoride application, Pit and fissure sealants applications with complete follow up and diet counseling	20	08	08	04
15	Special Assignments School Dental Health Programmes	03	01	01	01
16	Camps	02	01	01	

Structured Training Schedule

First Year

- Preclinical Exercises within the first six months
- 3 seminars in basic sciences
- 2 seminars in the Specialty
- 10 Journal Clubs
- Basic training in Computers and Photography
- Library Dissertation Work
- Commencement of Dissertation Work.
- Attending CDE/Workshops/Advanced Courses
- Attending a State/National Conference and presentation of a Scientific Paper.
- Publication of a scientific paper

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- Case Discussions –2
- Clinical Teaching of Undergraduate students
- APEX Posting
    - Pediatrics – 1week
    - Child Development Centre – 1week
    - Dental Radiology – 1week
    - Oral Pathology – 1week

Second Year

- 5 seminars in Specialty.
- Assisting and guiding Third year BDS students during their clinical posting.
- Taking lectures for Third BDS students on selected topics.
- 10 Journal Clubs.
- 2CPC
- Attending CDE/Workshops/Advanced Courses
- Attending a National Conference and presentation of a Scientific Paper.
- Completion of Dissertation.
- Publication of a scientific paper
- APEX Posting
    - Anesthesia and Pediatric Surgery – 2weeks
    - Plastic Surgery – 2weeks.
    - Trauma Centre Posting / Oral and Maxillofacial Surgery – 2weeks

Third Year

- 5 Seminars on Recent Advances in Pedodontics and Preventive Dentistry.
- 2CPC
- Attending CDE/Workshops/Advanced Courses
- Attending a National Conference and presentation of a Scientific Paper.
- Submission of Dissertation.

1. Scheme of Examination

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a. Written Examination

i. Number of papers -4

ii. Duration -3 hours each

iii. Maximum marks per paper -75

iv. Distribution of marks per paper - The type of questions in the three papers will be two long essay questions carrying 20 marks each and five short essay questions each carrying seven marks. There will be no options in the first three papers. The fourth is an essay paper with option and the candidate needs to answer only one.

Title of the papers-

Paper I – Applied Anatomy, Physiology, Microbiology, Nutrition and Dietetics
Paper II – Clinical pediatric dentistry

Paper III – Preventive and community dentistry as applied to pediatric

dentistry Paper IV –ESSAY with emphasis on Recent advances in Pedodontics

b. Practical/Clinical Examination

i. Duration - Two days

ii. Time - 9am to4pm.

iii. Marks - 200

Day I

1. Exercise I - Case Discussion, Pulp Therapy i.e. Pulpectomy on a Primary Molar.
2. Exercice 2 - Case Discussion, Crown preparation on a Primary Molar for Stainless steel crown and cementation of the same.
3. Exercise 3 - Case discussion, band adaptation for fixed type of space maintainer and-impression making.

Day II - Evaluation of Fixed Space Maintainer and Cementation.

Distribution of Marks for the Practicals

1. Case Discussion, Pulp Therapy i.e. Pulpectomy on a Primary Molar. – 75marks

1.1. Case Discussion 20marks

1.2. RubberDam application 10marks

1.3. Working length X-ray 20marks

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1.4. Obturation : 25marks

2. Case Discussion, Crown preparation on a Primary Molar for Stainless steel crown and cementation of the same.– 50marks

2.1. Case discussion 10marks

2.2. Crown Preparation 20marks

2.3. Crown selection and Cementation 20marks

3. **Case discussion, band adaptation for fixed type of space maintainer and-impression making.– 75 marks**

3.1. Case discussion 15marks

3.2. Band adaptation 20marks

3.3. Impression 20marks

3.4. Evaluation of Fixed Space Maintainer and Cementation : 20marks

TOTAL 200marks

C. VivaVoce: 100Marks

i. Viva voce 80marks

All examiners will conduct viva-voce conjointly on candidate's comprehension, analytical approach, expression, interpretation of data and communication skills.

ii. Pedagogy Exercise: 20marks

A topic will be given at the beginning of the clinical examination and will have to be presented for 8-10 minutes.

Practical/Clinical and Viva Voce Examination

Day	Time	Duration	Exercise
Day I	9am – 10am	1 hour	Detailed Case Examination
	10am – 11.30am	1 ½ hours	Pulpal Treatment
	11.30am – 1pm	1 ½ hours	Orthodontic Appliance (Band Adaptation & Impression)
	2pm – 3.30pm	1 ½ hours	Stainless Steel Crown
	3.30pm – 4.00pm	½ hour	Fabrication of Appliance
Day II	9am – 10am	1 hour	Delivery of Appliance

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	10am onwards	Dissertation presentation/Pedagogy and Viva voce

2.7 Total number of hours

As per the instruction given by the DCI.

2.8 Branches if any with definition

Pedodontics and Preventive Dentistry

2.9 Teaching learning methods

Method of Training

The training of a postgraduate student shall be full time but graded responsibilities in the management and treatment of patients entrusted to his/her care. The participation of the students in all facets of educational process is essential. Every candidate should take part in seminars, group discussions, case demonstrations, clinics, journal review meetings, and clinical meetings. Every candidate shall be required to participate in the teaching and training programme of undergraduate students and interns. Training should include involvement in laboratory and experimental work, and research studies. Every Institution undertaking Post Graduate training programme shall set up an Academic cell or a Curriculum Committee, under the chairmanship of a Senior faculty member, which shall work out the details of the training programme in each speciality in consultation with other Department faculty staff and also coordinate and monitor the implementation of these training Programmes.

Based on the above guidelines for a structured training programme for postgraduate courses, the basic tenets of a successful postgraduate teaching programme, are detailed under the following heads.

- **Formal Lectures** by the faculty on varied subjects including general areas and systems. Both senior and junior faculty can do this. However, the number of these classes should be maintained of low levels to encourage self-learning.
- **Symposia / Seminars** form an integral part of PG learning. A monthly symposium will generate approximate 30-35 symposia / course. These symposia can include department faculty and HODs as chairpersons and maximum involvement of both students and faculty should been sured.
- **Clinical Discussions** form the core of PG training and can be assigned to various clinical units on rotating basis. However other faculty could also actively participate in the discussion. The discussions must be 3-4/week. One suggestion is to score the performance of the candidate by a small panel of faculty and convey the scores to the candidate / PG at the end of the session.
- **Journal Club /Clinical Club** should be conducted at least once in a week in each postgraduate department. Journal clubs not only imparts new information but also

trains the candidate to objectively assess and criticize various articles which come out and should be useful in ensuring evidence based dentistry.

- **Guest Lectures** can be integrated into the PG program at least once in a month. Even the retired faculty can be invited for delivering the lectures and will ensure importing of greater wisdom to the candidates.
- **Orientation Classes** for newcomers should also be incorporated. These classes can even be assigned to junior faculty/senior PGs.
- **Clinical posting.** Each PG student should work in the clinics on regular basis to acquire adequate professional skills and competency in managing various cases to be treated by a specialist.
- **Clinico Pathological Conferences** should be held once a year involving the faculties of Oral Medicine and Radiology, Oral Pathology and concerned clinical department. The student should be encouraged to present the clinical details, radiological and histo- pathological interpretations and participation in the discussions.
- **Rotation postings in other departments** should be worked out by each department in order to bring in more integration between the speciality and allied fields.
- **Periodical Quiz** can be both informative and entertaining and should be encouraged and planned.
- **Computer Training and Internet Applications** are now becoming a must for both faculty and students. These areas should be strengthened as a next step. There can be a sort of internet information club in the departments.
- **Conferences/CDEs** – All postgraduate students should be encouraged to attend conferences and CDEs. They should also be asked to present papers wherever appropriate and should be rewarded by assigning scores for them.
- **Publication of scientific papers** – It is desirable and advisable to have at least two publications in the State/National/International indexed dental journals.
- **Involvement in Teaching Activity** – PG students can be assigned the job of teaching the undergraduate students and these will definitely improve the teaching skills in the postgraduate students.

Examinations

Evaluation is a continuous process, which is based upon criteria developed by the concerned authorities with certain objectives to assess the performance of the learner. This also indirectly helps in the measurement of effectiveness and quality of the concerned MDS programme. Evaluation is achieved by two processes

1) Formative or internal assessment

2) Summative or university examinations.

Formative evaluation is done through a series of tests and examinations conducted periodically by the institution. Summative evaluation is done by the university through examination conducted at the end of the specified course.

A candidate registered for MDS course must clear the final examination within six years of the date of admission. The examinations should be so organized that this shall be used as the mechanism to confirm that the candidate has acquired appropriate knowledge, skill and competence at the end of the training that he/she canactasa

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specialist and/or a medical teacher as per expectation. University examination will be held regularly by KUHS in April-May/October-November every year.

A candidate who wishes to study for MDS in a second specialty should have to take the full course of 3 years in that specialty and appear for examinations.

2.10 Content of each subject in each year

Present in clause 2.6

2.11 No: of hours per subject

Present in clause 2.6

2.12 Practical training

Present in clause 2.6

2.13 Records

Present in clause 2. 20

2.14 Dissertation: As per Dissertations Regulations of KUHS

Every candidate pursuing MDS degree course is required to carry out work on a selected research project under the guidance of a recognized postgraduate teacher. The results of such a work shall be submitted in the form of a dissertation.

The dissertation is aimed to train a postgraduate student in research methods and techniques. It includes identification of a problem, formulation of a hypothesis, search and review of literature, getting acquainted with recent advances, designing of a research study, collection of data, critical analysis, and comparison of results and drawing conclusions.

Every candidate shall submit to the University in the prescribed format a synopsis containing particulars of proposed dissertation work after obtaining ethical clearance from the Institutional Ethical Committee **within six months from the date of commencement of the course or before the dates notified by the University**. The synopsis shall be sent only through the Principal of the institution.

Such synopsis will be reviewed and the dissertation topic will be registered by the university. No change in the dissertation topic or guide/coguide shall be made without prior approval of the University. The dissertation should not be just a repetition of a previously undertaken study but it should try to explore some new aspects. The dissertation should be written under the following headings:

i. Introduction
ii. Aims and Objectives of the study
iii. Review of Literature
iv. Methodology
v. Results

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vi. Discussion
vii. Conclusion
viii. Summary
ix. References
x. Annexures

The written text of dissertation shall be not less than 50 pages and shall not exceed 150 pages excluding references, tables, questionnaires, and other annexures. It should be neatly typed (font size 13-Times New Roman or font size 13-Cambria) in 1.5 line spacing on one side of the paper (A4 size, 8.27" x 11.69") and bound properly. Spiral binding should be avoided. (Refer KUHS website). The guide, co-guide if any, Head of the Department and the Head of the Institution shall certify the dissertation.

For uniformity, it was suggested that the colour of the hard bind of the dissertation for all branches of MDS course in the purview of KUHS shall be dark brown with letters of gold colour. The title, author, and year of study should also be imprinted or embossed on the spine of the book. **Three hard copies and one properly labeled soft copy in a CD (refer KUHS website) of the dissertation thus prepared shall be submitted to KUHS on the 29th month of commencement of the course / 31st Oct. of the 3rd academic year, whichever falls first.** Dissertation should preferably be sent to a minimum of three reviewers / examiners /assessors, of which two shall be from outside the state and one from the affiliated colleges o KUHS. If modifications are to be made as specified, three hard copies and one soft copy of the dissertation after corrections made by the candidiate should be submitted with in a minimum of 30 days to the University. Consent for acceptance for evaluation of dissertation should be obtained from the reviewer/examiner/assessor before the dissertation are despatched. Proforma for evaluation of dissertation should be sent along with the copies of the dissertation to the reviewers appointed by the university. The proforma should contain all the assessment criteria with the clause – **Accepted/Accepted with modifications/Rejected** and reasons for rejection by the examiner. This proforma should be sent back to the University within two weeks / within the date specified after receipt of dissertation. The dissertation may be declared accepted if more than 50% of the reviewers (2 in the case of 3 reviewers) have accepted it. If modifications are to be made as specified, 3 hard copies and one soft copy of the dissertation after corrections made by the candidate should be submitted within 30 days to the University which may be sent back to the same examiner/s by the University for Acceptance after a fee has been levied from the candidate. If the dissertation has been rejected by more than 50% of the reviewers (2 in the case of 3 reviewers), the dissertation may be reviewed by an Expert Reviewing Committee comprising of not less than two subject experts, Dean (Research) of KUHS and Guide of the candidate provided the Guide requests for a review, after a fee has been levied from the candidate. If rejected by the Reviewing Committee, the candidate should take up a new topic and undergo all the procedures of submitting the synopsis, fees, IEC clearance, etc as prescribed by the University. The candidate who takes up the new topic can appear only for the subsequent examination.

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Approval of dissertation work is an essential precondition for a candidate to appear in the University examination. Hall tickets for the university examination should be issued to the candidate only if the dissertation has been accepted.

A candidate whose dissertation has been accepted by the examiners and approved by the University, but who is declared to have failed at the final examination will be permitted to reappear at the subsequent MDS examination without having to prepare a dissertation.

Guide – The academic qualification and teaching experience required for recognition by the University as a guide for dissertation work is as laid down by the Dental Council of India / KUHS.

Co-guide – A co-guide may be included provided the work requires substantial contribution from the same department or a sister department or from another institution recognized for teaching/training by KUHS/DCI. The co-guide should fulfill the academic qualification and teaching experience required for recognition by the University as a co-guide for dissertation work.

Change of Guide – In the event of a registered guide leaving the college for any reason or in the event of death of guide, guide may be changed with prior permission from the University.

2.15 Speciality training if any

Present in clause 2.6

2.16 Project work to be done if any

Present in clause 2.6

2.17 Any other requirements [CME, Paper Publishing etc.]

Present in clause 2.6

2.18 Prescribed/recommended textbooks for each subject

<u>Applied Basic Sciences</u>

SUBJECT	NAME OF AUTHOR	NAME OF BOOK
Anatomy	BD Chaurasia	BD Chaurasia's Human Anatomy
	William, Peter L	Grays Anatomy
Oral Anatomy	Ash, Major M	Wheelers Dental Anatomy, Physiology and Occlosion
	Sicher, Harry, Du Brull , Llyod	Oral Anatomy
Oral Histology	Bhaskar B.N. Ed	Orbans Oral Histology and Embryology
	Avery, James K	Essentials of Oral Histology and Embryology

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Embryology	Sadler	Langmans Medical Embryology
	Inderbeer Singh	Human Embryology
Physiology	Guyton Arthur and John L Hall	Text Book of Medical Physiology
	Ganong, William F	Review of Medical Pysiology
Pharmacology	KD Tripathi	Essentials of Medical Pharmachology
	Hardman, Joel G	Goodman and Gillmans pharmacological basis of Therapeutics
Nutrition	Nizel	Nutrition in Preventive Dentistry: Science and Practice
General Pathology	Cotran, Ramzi S and Others	Robbins Pathologic Basis of Disease
	Harsh Mohan	Textbook of Pathology
Oral Pathology	Shaffer, William and Others	Textbook of Oral Pathology
	Neville, Brad W and Others	Oral and Maxillofacial Pathology
Microbiology	Ananthanarayan and Panicker	Textbook of Microbiology
	Lakshman S	Essential Microbiology for Dentistry
Biostatistics	Dr. Symalan	Statistics in Medicine
	Soben Peter	Essentials of Preventive and Community Dentistry
	Sunder Rao and Richard J.	Introduction to Biostatistics and Research Methods

Pedodontics and Preventive Dentistry

List of Essential and Recommended Reference Books

1. Dentistry for the Handicapped Child — Kenneth E. Wessels
2. Dental Management of the Child Patient — HanneloreT.Loevy
3. Development of Dentition — Van der Linden
4. Dentistry of the Child & Adolescent — Mac Donald & Avery
5. Dentistry for the Adolescent — Castaldy& Brass
6. Essentials of Dental Caries – The Disease and its management — Kidd-Joysten
7. Endodontics — Nicholls
8. Endodontology – Biologic considerations — Samuel Seltzer
9. Fluoride in Preventive Dentistry — Melberg, Louis Ripa
10. Fundamentals of Pediatric Dentistry — Mathewson

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11.	Manual of Pedodontics	Andlow& Rock
12.	Minor tooth movement in children	Joseph M. Sim
13.	Nutrition in Preventive Dentistry	Nizel
14.	Principles & Practice of Orthodontics	Graber
15.	Pediatric Dentistry – Scientific foundations	Stewart & Wei
16.	Pediatric Dentistry – Infancy through Adolescence	Pinkham
17.	Pediatric Dentistry – Total Patient Care	Wei
18.	Treatment of Traumatised incisor in the child patient	Ronald Johnson
19.	Cariology Today	Guggenhein
20.	Orthodontics – Current Principles & Techniques	Graber & Swain
21.	Cariology	Ernest Newbrun
22.	Pediatric Operative Dentistry	Kennedy
23.	Synopsis of Orthodontics	Rani
24.	Handbook of Local Anaesthesia	Malamed
25.	Community Dental Health	Jong
26.	Handbook of Clinical Pedodontics	Snawder
27.	Growing up Cavity Free	Moss
28.	Dentistry for the Preschool Child	Davies
29.	Dentistry for Children	Brauer&Hisley
30.	Practical Treatment Planning for the Pedodontic Patient	Blinkhein
31.	Nutrition in Clinical Practice	Nizel
32.	The Human Dentition Before Birth	Kraus & Jordan
33.	Appropriate Uses of Fluorides for Human Health	J.J.Murray (WHO)
34.	Fluoride in Preventive Dentistry – Theory & Clinical Practice	Mellberg&Ripa
35.	Trace Elements & Dental Diseases	Curzon
36.	Fluorides in Caries Prevention	Murray, Rugg-Gunn
37.	A Symposium on Preventive Dentistry	Muhler
38.	Antibiotic – Antimicrobial Use in Dental Practice	Newmann
39.	Applied Dental Materials	McCabe

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40.	Cross Infection Control in General Practice	Croser& Davies
41.	Congenital Deformities	Gordon, Gause
42.	Caries Resistant Teeth	Wolstenholm
43.	Dental Materials - Properties & Manipulation	Craig
44.	Dental Caries	Silverstone
45.	Dentistry for the Special Patient	Davidoff
46.	Fixed Orthodontic Appliances	Williams
47.	Hand Book of Facial Growth	Enlow
48.	Human Embryology	Inderbir Singh
49.	Orthodontic Cephalometry	Athanasiou
50.	Preventive Dentistry	Forrest
51.	Study of Tooth Shapes- A systematic Approach	Grundler
52.	Radiographic Cephalometry	Jacobson
53.	Comprehensive textbook of Psychiatry	Kaplan
54.	Science of Dental Materials	Skinners
55.	Rubber Dam in Clinical Practice	Reid
56.	Diagnosis of the Orthodontic Patient	McDonald & Ireland
57.	Fixed Orthodontic Appliances – Principles & Practice	Issacson& Thom
58.	Decision making in Dental Treatment Planning	Hall & Roberts
59.	Plaque & Calculus Removal	Cochran, Brunsvold
60.	Community Oral Health	Pine
61.	Primary & Emergency Dental Care	Figures & Lamb
62.	Principles of Dental Treatment Planning	Morris
63.	A practical Guide to Technology in Dentistry	Jedynakiewicz
64.	The Art & Science 0f Operative Dentistry	Sturdevant
65.	Endodontic Therapy	Weine
66.	Endodontics	Ingle
67.	Endodontics in Clinical Practice	Harty
68.	Pathways of the Pulp	Cohen

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69.	Esthetic Composite Bonding	Jordan
70.	Esthetic Restorations	Mula
71.	Modern Concepts in the Diagnosis & Treatment of Fissure Caries	Paterson & Watts
72.	Dentin & Pulp in Restorative Dentistry	Brannstrom
73.	Oral Development & Histology	Tencate
74.	Textbook of Oral Pathology	Shafer
75.	Oral Pathology	Ash
76.	An Introduction to Fixed Appliances	Isaccson
77.	Dental Care for Handicapped Patients	Hunter
78.	Clinical Pedodontics	Finn

2.19 Reference books

As instructed by HOD

2.20 Journals

ASDC Journal of Dentistry for Children

Pediatric Dentistry

International Journal of Pediatric Dentistry

Journal of Clinical Pediatric Dentistry

International Journal of Clinical Pediatric Dentistry

Journal of Dentistry for Children

Journal of the Indian Society of Pedodontics and Preventive Dentistry.

Australian Dental Journal

British Dental Journal

Dental Clinics of North America

Endodontics& Dental Traumatology

International Dental Journal

International Endodontic Journal

JADA

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Journal of Dental Research

Journal of Dentistry

Journal of Endodontics

Journal of Indian Dental Association

Advanced Dental Research

2.21 Logbook

- **Work Diary / Log Book**

Logbooks serve as a document of the trainee's work. The trainee shall maintain this Logbook of the special procedures/operations observed/assisted/performed by him/her during the training period right from the point of entry and its authenticity shall be assessed weekly by the concerned Post Graduate Teacher / Head of the Department. This shall be made available to the Board of Examiners for their perusal at the time of his / her appearing at the Final examination. The logbook should record clinical cases seen and presented, procedures and tests performed, seminars, journal club and other presentations. Logbook entries must be qualitative and not merely quantitative, focusing on learning points and recent advances in the area and must include short review of recent literature relevant to the entry. A work diary containing all the various treatment done by the candidate in the course of the study should also be maintained. The work diary shall be scrutinized and certified by both the guide/co guide and Head of the Department and presented in the University practical/clinical examination.

3 EXAMINATIONS

3.1 Eligibility to appear for exams

Every candidate to become eligible to appear for the **MDS examination** shall fulfill the following requirements.

Attendance

Every candidate shall have fulfilled the attendance prescribed by the University during **each academic year** of the Postgraduate course. A candidate becomes eligible for writing the University examination only after the completion of 36 months from the date of commencement of the course.

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The candidates should have completed the training period before the commencement of examination.

Dissertation

Approval of the dissertation is a mandatory requirement for the candidate to appear for the university examination.

Library Dissertation

Submission of the library dissertation as per the regulations of the DCI / KUHS is mandatory for the candidate to appear for the examination.

Progress and Conduct

Every candidate shall have participated in seminars, journal review meetings, symposia, conferences, case presentations, clinics and didactic lectures during each year as designed by the concerned department.

Work Diary and Logbook

Every candidate shall maintain a work diary and logbook for recording his/her participation in the training programmes conducted by the department. The work diary and logbook shall be verified and certified by the Head of the department.

The certification of satisfactory progress by the Head of the Department and Head of the Institution shall be based on checklist given in 5.1 to5.8.

- **Students should note that in case they do not complete the exercises and work allotted to them within the period prescribed, their course requirements will be considered unfulfilled.**
- **Clinical Records, Work Diaries and Logbooks should be maintained regularly and approved by the guide, duly certified by the Head of the Department.**

3.2 Schedule of Regular/Supplementary exams

The MDS examination shall be held at the end of the third academic year. The university shall conduct two examinations in a year at an interval of four to six months between two examinations. **Not more than two examinations shall be conducted in an academic year.**

3.3 Scheme of examination showing maximum marks and minimum marks

- MDS examination will consist of Written (Theory), Viva Voce, and Practical / Cliniical examination

Written Examination (Theory) : 300 Marks

Written examination shall consist of **four question papers**, each of three hours duration . Each paper shall carry 75 marks. The type of questions in the first three papers will be two long essay questions carrying 20 marks each and five short essay questions each carrying seven marks. **There will be no options in the questions in the first 3 papers. Fourth paper will be a single essay question paper which will carry an option and the candidate is to**

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answer only one of the essays. Questions on recent advances may be asked in any or all the papers. **The syllabus for the theory papers of the concerned specialty should cover the entire field of the subject. Though the topics assigned to the different papers are generally evaluated under designated papers, a strict division of the subject may not be possible and some overlapping of topics is inevitable. Students should be prepared to answer overlapping topics.** The theory examinations shall be held sufficiently earlier than the practical/clinical examinations so that the answer books can be assessed and evaluated before the start of the practical/clinical examination. The total marks for the theory examination shall be 300.

Practical Examination: 200 Marks

In case of practical examination, it should aim at assessing competence and skills of techniques and procedures. It should also aim at testing student's ability to make relevant and valid observations, interpretation and inference of laboratory or experimental or clinical work relating to his/her subject for undertaking independent work as a specialist. The total mark for practical/clinical examinations shall be 200.

Viva voce; 100 Marks

Viva voce examination shall aim at assessing depth of knowledge, logical reasoning, confidence and oral communication skills. The candidate may be given a topic for the pedagogy in the beginning of the clinical examination and asked to make a presentation on the topic for 8-10 minutes. The total marks shall be 100 of which 80 would be for the viva voce (20 marks/examiner) and 20 marks for the pedagogy.

3.4 Papers in each year

Paper-I-Applied Anatomy, Physiology, Pathology, Microbiology, Nutrition and Dietics
Paper-II - Clinical pediatric dentistry
Paper-**III** -Preventive and community dentistry as applied to pediatric dentistry
Paper-IV -Essay

3.5 Details of theory exams

Distribution of topics for each paper will be as follows:

PAPER-I : Applied Basic Sciences : Applied Anatomy, Physiology, Pathology, Microbiology, Nutrition & Dietics, Growth & Development and Dental plaque, Genetics.

PAPER-II : Clinical Paedodontics

1. Conscious sedation, Deep Sedation & General Anesthesia in Pediatric Dentistry
2. Gingival & Periodontal Diseases in Children
3. Pediatric Operative Dentistry
4. Pediatric Endodontics
5. Traumatic Injuries in Children Interceptive Orthodontics
6. Oral Habits in children
7. Dental Care of Children with special needs

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8. Oral Manifestations of Systemic Conditions in Children & their Management
9. Management of Minor Oral Surgical Procedures in Children
10. Dental Radiology as Related to Pediatric Dentistry
11. Pediatric Oral Medicine & Clinical Pathology
12. Congenital Abnormalities in Children
13. Dental Emergencies in Children & Their Management
14. Dental Materials Used in Pediatric Dentistry
15. Case History Recording
16. Setting up of Pedodontic & Preventive Dentistry Clinic

PAPER III: Preventive and Community Dentistry as applied to Pediatric Dentistry

1. Child Psychology
2. Behavior Management
3. Child Abuse & Dental Neglect
4. Preventive Pedodontics
5. Cariology
6. Preventive Dentistry
7. Dental Health Education & School Dental Health Programmes
8. Fluorides
9. Epidemiology
10. Comprehensive Infant Oral Health Care/Comprehensive cleft care
11. Principles of Bio-Statistics & Research Methodology & Understanding of Computers and Photography

PAPER-IV: Essay

3.6 Model Question Papers

M.D.S. – Pedodontics and Preventive Dentistry

Paper I – Applied Anatomy, Physiology, Pathology, Microbiology, Nutrition and Dietics

Time 3 Hrs.

Maximum Marks 75

(Answer all questions.)

Long Essays **(2x 20 = 40marks)**

1.Discuss the stages of Amelogenesis along with its applied aspects.

2.How and why is the reaction of the pulpal connective tissue to injury different from that of the connective tissue elsewhere in the body? Discuss in detail the pathophysiology of the pulp?

Short essays **(5 x 7 =35marks)**

3.Muscles of Mastication

4.Growth spurts

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5.Facial artery

6.Development of palate

7.Recombinant DNA technology

Paper – II – Clinical Pedodontics

Time 3 hrs

Marks 75

Long Essays (2x 20= 20marks)

1.Discuss at length regarding inhalation conscious sedation in pedodontics. Add a note on dissociative anaethesia.

2.Discuss in detail the management of digit sucking habit in a nine year old female child.

Short essays (5 x 7 = 35marks)

3.Regional Odontodysplasia

4.Tunnel cavity preparation

5.Apexification

6.Titanium trauma splints

7.Localized aggressive periodontitis

Paper – III – Preventive and Public Health Dentistry in Children

(Answer all questions)

Time 3 hrs

Maximum marks 75

Long Essays (2x 20= 20marks)

1.Discuss the psychological development of a child from birth to adolescence in the light of various theories of personality development.

2.Elaborate on the variables influencing a space management program. Add a note on palatal arch appliance.

Short essays (5 x 7 = 35marks)

3.Conservative adhesive resin restorations.

4.Transmission of S.mutans.

5.Mouth guards.

6.Case control study.

7.Dental home.

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Paper IV –Essay -Recent advances in Pedodontics.

(Answer any one question)

Time 3 Hrs.

Maximum Marks 75

Critically evaluate the recent endodontic filling materials used in primary teeth.

OR

Concept of Dental Home

3.7 Internal assessment component

Not applicable.

3.8 Details of practical/clinical exams

c. Practical/Clinical Examination

i.	Duration	-	Two days
ii.	Time	-	9am to4pm.
iii.	Marks	-	200

Day I

4. Exercise I - Case Discussion, Pulp Therapy i.e. Pulpectomy on a Primary Molar.
5. Exercice 2 - Case Discussion, Crown preparation on a Primary Molar for Stainless steel crown and cementation of the same.
6. Exercise 3 - Case discussion, band adaptation for fixed type of space maintainer and-impression making.

Day II - Evaluation of Fixed Space Maintainer and Cementation.

Distribution of Marks for the Practicals

4. Case Discussion, Pulp Therapy i.e. Pulpectomy on a Primary Molar. – 75marks

4.1. Case Discussion	10marks
4.2. Rubber Dam application	20marks
4.3. Working length X-ray	20marks
4.4. Obturation	25marks

5. Case Discussion, Crown preparation on a Primary Molar for Stainless steel crown and cementation of the same.– 50marks

5.1. Case discussion	10marks
5.2. Crown Preparation	20marks
5.3. Crown selection and Cementation	20marks

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6. Case discussion, band adaptation for fixed type of space maintainer and-impression making.– 75marks

6.1. Case discussion 15marks
6.2. Band adaptation 20marks
6.3. Impression 20marks
6.4. Evaluation of Fixed Space Maintainer and Cementation : 20marks

TOTAL 200marks

C. Viva Voce: 100Marks

iii. Viva voce 80marks

All examiners will conduct viva-voce conjointly on candidate's comprehension, analytical approach, expression, interpretation of data and communication skills.

iv. Pedagogy Exercise: 20marks

A topic will be given at the beginning of the clinical examination and will have to be presented for 8-10 minutes.

Practical/Clinical and Viva Voce Examination

Day	Time	Duration	Exercise
Day I	9am – 10am	1 hour	Detailed Case Examination
	10am – 11.30am	1 ½ hours	Pulpal Treatment
	11.30am – 1pm	1 ½ hours	Orthodontic Appliance (Band Adaptation & Impression)
	2pm – 3.30pm	1 ½ hours	Stainless Steel Crown
	3.30pm – 4.00pm	½ hour	Fabrication of Appliance
Day II	9am – 10am	1 hour	Delivery of Appliance
	10am onwards	Dissertation presentation/Pedagogy and Viva voce	

3.9 Number of examiners needed (Internal & External) and their qualifications

There shall be at least four examiners in each branch of study. Out of four, two (50%) should be external examiners and two shall be internal examiners. The qualification and teaching experience for appointment as an examiner shall be as laid down by the DCI. The external examiners shall ordinarily be invited from another recognized University from outside the state. An external examiner may ordinarily be appointed for the same institute for not more than two years consecutively. Thereafter he may be reappointed after an interval of one year. The same set of examiners shall ordinarily be responsible for the practical and oral part of the examination.

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The Head of the Department shall ordinarily be one of the examiners and the chairperson of the Board of Examinations; second internal examiner shall rotate after every two consecutive examinations if there are more than two postgraduate teachers in the department other than the Head of the department. No person who is not an active Postgraduate teacher in that subject can be appointed as Examiner. However in case of retired personnel, a teacher who satisfies the above conditions could be appointed as examiner up to one year after retirement.

For the MDS examination, if there are no two qualified internal examiners in an institute the second internal examiner can be from a neighbouring DCI and KUHS approved / recognized Dental College having PG course in the specific speciality. This examiner should be an active PG teacher in the same speciality with the qualifications and experience recommended for a teacher for postgraduate degree programme. The examination can also be conducted by one qualified internal examiner and three qualified external examiners if there is no qualified second internal examiner.

Reciprocal arrangement of Examiners should be discouraged, in that, the internal examiner in a subject should not accept external examinership of a college from which the external examiner is appointed in his subject in the same academic year.

3.10 Details of viva

Viva Voce :100Marks

i. Viva-Voce examination :80 marks

All examiners will conduct viva-voce conjointly on candidate's comprehension, analytical approach, expression, interpretation of data and communication skills. It includes all components of course contents. It includes presentation and discussion on dissertation also.

v. Pedagogy and thesis presentation : 10 +10 = 20marks

4.INTERNSHIP

Not Applicable for PG Courses

5 ANNEXURES

5.Check Lists for Monitoring: Log Book, Seminar Assessment etc.

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CHECKLISTS and LOGBOOK

5.1 Checklist 1

Model Checklist for Evaluation of Preclinical Exercises

Name of Student: Date:

Name of the Faculty-in-charge:

Name of Exercise

Sl. No:	Items for observation during evaluation	Score
1	Quality of Exercise	
2	Ability to answer to questions	
3	Punctuality in submission of exercise	
4	TOTAL SCORE	

Performance	Score
Poor	0
Below Average	1
Average	2
Good	3
Very good	4

Signature of Faculty-in-charge

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5.2:Checklist 2

Model Checklist for Evaluation of Journal Review / Seminar Presentation

Name of Student: Date:

Name of the Faculty/Observer:

Name of Journal / Seminar:

Sl. No:	Items for observation during evaluation	Score
1	Relevance of Topic	
2	Appropriate Cross references	
3	Completeness of Preparation	
4	Ability to respond to questions	
5	Effectiveness of Audio-visual aids used	
6	Time Scheduling	
7	Clarity of Presentation	
8	Overall performance	
9	TOTAL SCORE	

Performance	Score
Poor	0
Below Average	1
Average	2
Good	3
Very good	4

Signature of Faculty/Observer

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5.3 :Checklist 3

Model Checklist for Evaluation of Clinical Case and Clinical Work

Name of Student: Date:

Name of the Faculty/Observer:

Sl. No:	Items for observation during evaluation	Score
1	History	
	Elicitation	
	Completeness	
2	Examination	
	General Examination	
	Extra oral examination	
	Intraoral examination	
3	Provisional Diagnosis	
4	Investigation	
	Complete and Relevant	
	Interpretation	
5	Diagnosis	
	Ability to defend diagnosis	
6	Differential Diagnosis	
	Ability to justify differential diagnosis	
7	Treatment Plan	
	Accuracy	
	Priority order	
8	Management	
9	Overall Observation	
	Chair side manners	
	Rapport with patient	
	Maintenance of Case Record	
	Quality of Clinical Work	
	Presentation of Completed Case	
10	TOTAL SCORE	

Performance	Score
Poor	0
Below Average	1
Average	2
Good	3
Very good	4

Signature of Faculty/Observer

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5.4:Checklist 4

Model Checklist for Evaluation of Library Dissertation Work

Name of Student: Date:

Name of the Faculty/Guide:

Sl. No:	Items for observation during evaluation	Score
1	Interest shown in selecting topic	
2	Relevance of Topic	
3	Preparation of Proforma	
4	Appropriate review	
5	Appropriate Cross references	
6	Periodic consultation with guide	
7	Completeness of Preparation	
8	Ability to respond to questions	
9	Quality of final output	
9	TOTAL SCORE	

Performance	Score
Poor	0
Below Average	1
Average	2
Good	3
Very good	4

Signature of Faculty/Guide

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5.5:Checklist 5

Model Checklist for Evaluation of Dissertation Work

Name of Student: Date:

Name of the Faculty/Guide/Co-guide:

Sl. No:	Items for observation during evaluation	Score	Performance	Score
1	Interest shown in selecting topic		Poor	0
2	Relevance of Topic		Below Average	1
3	Preparation of Proforma		Average	2
4	Appropriate review		Good	3
5	Appropriate Cross references		Very good	4
6	Periodic consultation with guide/co- guide			
7	Depth of Analysis / Discuss			
8	Ability to respond to questions			
9	Department Presentation of findings			
10	Quality of final output			
	TOTAL SCORE			

Signature of Faculty/Guide/Co-guide

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5.6:CHECKLIST-6

CONTINUOUS EVALUATION OF DISSERTATION WORK BY GUIDE/CO-GUIDE

Name of the Trainee: Date

Name of the Faculty/Observer:

SI.No.	Items for observation during presentation	Poor 0	Below Average 1	Average 2	Good 3	Very Good 4
1.	Periodic consultation with guide / co- guide					
2.	Regular collection of case material					
3.	Depth of Analysis / Discussion					
4.	Department presentation of findings					
5.	Quality of final output					
6.	Others					
	Total score					

Signature of the guide / co-guide

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5.7;CHECKLIST -7

OVERALL ASSESSMENT SHEET

Name of the College: Date:

Name of Department:

Check List No	PARTICULARS	Name of trainee		
		First Year	Second Year	Third Year
1	Preclinical Exercises			
2.	Journal Review Presentation			
3.	Seminars			
4	Library dissertation			
5.	Clinical work			
6-	Clinical presentation			
7.	Teaching skill practice			
8.	Dissertation			
	TOTAL			

Signature of HOD **Signature of Principal**

The above overall assessment sheet used along with the logbook should form the basis for certifying satisfactory completion of course of study, in addition to the attendance requirement.

Key:

Mean score: Is the sum of all the scores of checklists 1 to 6

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5.8:LOGBOOK

DEPARTMENT OF ……..

MDS Programme

LOG BOOK OF

NAME…….

BIODATA OF THE CANDIDATE

EXPERIENCE BEFORE JOINING P.G. COURSE

DETAILS OF POSTING :

- **FIRST YEAR**
- **SECOND YEAR**
- **THIRD YEAR**

DETAILS OF LEAVE AVAILED

PRECLINICAL EXERCISES

LIBRARY DISSERTATION

RESEARCH WORK

PARTICIPATION IN CONFERENCES – CDE PROGRAMMES

DETAILS OF PARTICIPATION IN ACADEMIC PROGRAMME

SEMINARS /SYMPOSIA PRESENTED

JOURNAL CLUBS

TEACHING ASSIGNMENTS – UNDERGRADUATES / PARAMEDICAL.

SPECIAL DUTIES (IF ANY)

INTERNAL ASSESSMENT

DAILY ACTIVITIES RECORD (BLANK PAGES)

ONE PAGE FOR EACH MONTH X 36 PAGES

MISCELLANEOUS

SUMMARY

☆

5.8.1 :LOGBOOK-1

ACADEMIC ACTIVITIES ATTENDED

Name:

Admission Year:

College:

Date	Type of activity - Specify Seminar, Journal club, Presentation, UG teaching	Particulars

☆

5.8.2 :LOG BOOK -2

ACADEMIC PRESENTATIONS MADE BY THE TRAINEE

Name :

Admission Year:

College:

Date	Topic	Type of activity - Specify Seminar, Journal club, Presentation, UG teaching

☆

5.8.3 :LOGBOOK-3

DIAGNOSTIC AND OPERATIVE PROCEDURES PERFORMED

Name

Admission Year:

College:

Date	Name	OP No.	Procedure	Category **0,** A, PA, PI

Key:

O- WASHED UP AND OBSERVED - INITIAL 6 MONTHS OF ADMISSION

A-ASSISTED A MORE SENIOR SURGEON -1 YEAR MDS

PA - PERFORMED PROCEDURE UNDER THE DIRECT SUPERVISION OF A SENIOR SURGEON - II YEAR MDS

PI-PERFORMED INDEPENDENTLY - III YEAR MDS

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REGULATIONS 2016

SYLLABUS

for Courses affiliated to the

Kerala University of Health Sciences

Thrissur 680596

Master of Dental Surgery (MDS)

Oral Medicine and Radiology

Course Code: 248

(2016-17 Academic year onwards)

2016

2. COURSE CONTENT

2.1 Title of course:

MDS Oral Medicine and Radiology

2.2 Objectives of course

1. Goals

The goals of postgraduate training in various specialities are to train the BDS graduate who will:

- Practice respective specialty efficiently and effectively, backed by scientific knowledge and skill.
- Exercise empathy and a caring attitude and maintain high ethical standards.
- Continue to evince keen interest in continuing professional education in the specialty and allied specialties irrespective of whether in teaching or practice.
- Willing to share the knowledge and skills with any learner, junior or a colleague.
- To develop the faculty for critical analysis and evaluation of various concepts and views, to adopt the most rational approach.

2. Objectives

The objective is to train a candidate so as to ensure higher competence in both general and special area of interest and prepare him for a career in teaching, research and specialty practice. A candidate must achieve a high degree of clinical proficiency in the subject matter and develop competence in research and its methodology as related to the field concerned.

The above objectives are to be achieved by the time the candidate completes the course. The objectives may be considered as under –

1. Knowledge (Cognitive Domain)
2. Skills (Psychomotor Domain)
3. Human values, ethical practice and communication abilities.

2.1. Knowledge

- Demonstrate understanding of basic sciences relevant to the specialty.
- Describe etiology, pathophysiology, principles of diagnosis and management of common problem within the specialty in adults and children.
- Identify social, economic, environmental and emotional determinants in a given case and take them into account for planning treatment.
- Recognize conditions that may be outside the area of specialty/competence and to refer them to an appropriate specialist.
- Update knowledge by self-study and by attending courses, conferences and seminars relevant to specialty.

- Undertake audit; use information technology and carryout research both basic and clinical with the aim of publishing or presenting the work at various scientific gatherings.

2.2. Skills

- Take a proper clinical history, examine the patient, perform essential diagnostic procedures and order relevant tests and interpret them to come to a reasonable diagnosis about the condition.
- Acquire adequate skills and competence in performing various procedures as required in the specialty.

2.3. Human values, ethical practice and communication abilities

- Adopt ethical principles in all aspects of practice.
- Foster professional honesty and integrity.
- Deliver patient care, irrespective of social status, caste, creed, or religion of the patient.
- Develop communication skills, in particular skill to explain various options available in management and to obtain a true informed consent from the patient.
- Provide leadership and get the best out of his team in congenial working atmosphere.
- Apply high moral and ethical standards while carrying out human or animal research.
- Be humble and accept the limitations in his knowledge and skill and to ask for help from colleagues when needed.
- Respect patient's rights and privileges including patient's right to information and right to seek a second opinion.

2.3 Medium of instruction:

The medium of instruction for the course shall be English.

2.4 Course outline

Oral medicine is that specialty concerned with the basic diagnostic procedures and techniques useful in recognizing the diseases of the oral tissues of local and constitutional origin and their medical management. Radiology is a science dealing with x-rays and their uses in diagnosis and treatment of diseases in relation to orofacial diseases.

2.5 Duration

The course shall be of **three years** duration. All the candidates for the degree of MDS are required to pursue the recommended course for at least three academic years as full time candidates in an institution affiliated to and approved for Postgraduate studies by KUHS, observing the norms put forward by the DCI.

i. There will be no reduction for the course duration for any of the students including service candidates, diploma holders and those who have done senior house surgeoncy or equivalent research experience.
ii. No student shall be permitted to complete the course by attending more than 6 continuous years.
iii. A candidate selected for admission in a Dental College is obliged to follow the curriculum, rules and regulations as approved by the Dental Council of India and the University. Curriculum, rules or regulations are subject to changes from time to time.

2.6 Syllabus

The syllabus for the theory of Oral Medicine and Radiology should cover the entire field of the subject and the following topics may be used as guidelines.

The concept of health care counseling shall be incorporated in all relevant areas.

Paper I*: Applied anatomy, physiology, pathology and pharmacology*

1. Applied Anatomy

- Gross anatomy of the face:
- Muscles of Facial Expression And Muscles Of Mastication
- Facial nerve
- Facial artery
- Facial vein
- Parotid gland and its relations

2. Neck region:

- Triangles of the neck with special reference to Carotid, Digastric triangles and midline structures
- Facial spaces
- Carotid system of arteries, Vertebral Artery, and Subclavian arteries
- Jugular system Internal jugular External jugular
- Lymphatic drainage
- Cervical plane
- Muscles derived from Pharyngeal arches
- Infratemporal fossa in detail and temporomandibular joint
- Endocrine glands

- Sympathetic chain
- Cranial nerves-V,VII,VIII,IX,X,XI,&XII
- Exocrine gland

3.Oral Cavity:

- Vestibule and oral cavity proper
- Tongue and teeth
- Palate-soft and hard

4.Nasal Cavity

- Nasal septum
- Lateral wall of nasal cavity
- Paranasal air sinuses

5.Pharynx:

6. Gross salient features of brain and spinal cord with references to attachment of cranial nerves to the brainstem. Detailed study of the cranial nerve nuclei of V, VII, VIII, IX, X, XI, XII

7. Osteology: Comparative study of fetal and adult skull Mandible: Development, ossification, age changes and evaluation of mandible in detail

Embryology

1. Development of face, palate, nasal septum and nasal cavity, para nasal air sinuses
2. Pharyngeal apparatus in detail including the floor of the primitive pharynx
3. Development of tooth in detail and the age changes
4. Development of salivary glands
5. Congenital anomalies of face must be dealt in detail.

Histology:

1. Study of epithelium of oral cavity and the respiratory tract
2. Connective tissue
3. Muscular tissue
4. Nervous tissue
5. Blood vessels
6. Cartilage
7. Bone and tooth
8. Tongue
9. Salivary glands
10. Tonsil, thymus, lymph nodes

Physiology:

1. **General Physiology:**

- Cell
- Body Fluid Compartments
- Neuromuscular transmission
- Mechanism of muscle contraction

Blood:

- RBC and Hb
- WBC - Structure and functions
- Platelets - functions and applied aspects
- Plasma proteins
- Blood Coagulation with applied aspects
- Blood groups
- Lymph and applied aspects

Respiratory System:

- Air passages,composition of air,dead space,mechanics of respiration with pressure and volume changes
- Lung volumes and capacities and applied aspects
- Oxygen and carbon dioxide transport
- Neural regulation of respiration
- Chemical regulation of respiration
- Hypoxia, effects of increased barometric pressure and decreased barometric pressure
- Cardio-Vascular System:
- Cardiac Cycle
- Regulation of heart rate/Stroke volume/cardiac output/blood flow
- Regulation f blood pressure
- Shock, hypertension, cardiac failure

Excretory system

- Renal function tests

Gastro - intestinal tract:

- Composition, functions and regulation of:
- Saliva
- Gastric juice
- Pancreatic juice
- Bile and intestinal juice
- Mastication and deglutition

Endocrine system:

- Hormones –classification and mechanism of action
- Hypothalamic and pituitary hormones
- Thyroid hormones
- Parathyroid hormones and calcium homeostasis
- Pancreatic hormones
- Adrenal hormones

Central Nervous System:

- Ascending tract with special references to pain pathway

Special Senses:

- Gustation and Olfaction

Biochemistry

1. **Carbohydrates**
   - Disaccharides specifically maltose, lactose, sucrose
   - -Digestion of starch/absorption of glucose
   - -Metabolism of glucose, specifically glycolysis, TCA cycle, gluconeogenesis
   - -Blood sugar regulation
   - -Glycogen storage regulation
   - -Glycogen storage diseases
   - -Galactosemia and fructosemia
2. **Lipids**
   - Fatty acids- Essential/nonessential
   - Metabolism of fatty acids-oxidation, ketone body formation, utilization ketosis
   - Outline of cholesterol metabolism-synthesis and products formed from cholesterol
3. **Protein**
   - -Amino acids- essential/nonessential, complete/ incomplete proteins
   - Transamination/ Deamination (Definition with examples)
   - -Urea cycle
   - Tyrosine- Hormones synthesized from tyrosine
   - -In born errors of amino acid metabolism
   - Methionine and trans methylation
4. **Nucleic Acids**
   - Purines/Pyrimidines Purine analogs in medicine
   - DNA/RNA-Outline of structure
   - -Transcription/translation
   - Steps of protein synthesis Inhibitors of protein synthesis Regulation of gene function
5. **Minerals**
   - Calcium/Phosphorus metabolism specifically regulation of serum calcium levels
   - -Iron metabolism
   - Iodine metabolism
   - -Trace elements in nutrition
6. **Energy Metabolism**
   - Basal metabolic rate
   - Specific dynamic action (SDA) of foods
7. **Vitamins**

   -Mainly the vitamins and their metabolic role- specifically vitamin A, Vitamin C, Vitamin D, Thiamin, Riboflavin, Niacin, Pyridoxine

Pathology:

1. Inflammation:
   - Repair and regeneration, necrosis and gangrene
   - Role of complement system in acute inflammation
   - Role of arachidonic acid and its metabolites in acute inflammation
   - Growth factors in acute inflammation

- Role of molecular events in cell growth and intercellular signaling cell surface receptors
- *Role of NSAIDS* in inflammation
- Cellular changes in radiation injury and its

manifestations Homeostasis

- Role of Endothelium in thrombo -genesis
- Arterial and venous thrombi
- Disseminated Intravascular Coagulation

Shock

- Pathogenesis of hemorrhagic, neurogenic, septic, cardiogenic shock, circulatory

disturbances, ischemic hyperemia, venous congestion, edema, infarction

Chromosomal Abnormalities:

- Mar fan's syndrome
- Ehler's Danlos Syndrome
- Fragile X Syndrome

Hypersensitivity:

- Anaphylaxis
- Type II Hypersensitivity
- Type III Hypersensitivity
- Cell mediated Reaction and its clinical importance
- Systemic Lupus Erythmatosus
- Infection and infective granulomas

Neoplasia:

- Classification of Tumors
- Carcinogenesis & Carcinogens - Chemical, Viral and Microbial
- Grading and Staging pf Cancer, tumor Angiogenesis, Paraneoplastic Syndrome
- Spread of tumors
- Characteristics of benign and malignant tumors Others:
- Sex linked agammaglobulinemic
- AIDS
- Management of Immune deficiency patients requiring surgical procedures
- De George'sSyndrome
- Ghons complex, post primary pulmonary tuberculosis - pathology and pathogenesis

Phamacology:

1. Definition of terminologies used
2. Dosage and mode of administration of drugs
3. Action and fate of drugs in the body
4. Drugs acting on the CNS

5. Drug addiction, tolerance and hypersensitive reactions
6. General and local anesthetics, hypnotics, analeptics, and tranquilizers
7. Chemotherapeutics and antibiotics
8. Analgesics and anti -pyretics
9. Anti - tubercular and anti – syphilitic drugs
10. Antiseptics, sialogogues, and anti -sialogogues
11. Haematinics
12. Anti -diabetics
13. Vitamins - A B Complex, C, D, E & K
14. Steroids

ORAL MEDICINE

1. General principles of patient examination, systems review, procedures for diagnosis and examination of specific lesions.
2. Diagnostic laboratory investigations:
   2.1. Routine: Collection of samples, laboratory investigative procedures, normal values interpretation of results.
   2.2. Special Laboratory Investigations: Blood Chemistry, Sialochemistry, Serology.
3. Microbiology, Immunology, Histology, Cytology.
4. Culture techniques: Collection, presentation and transportation of specimens.
5. Biopsy - types and procedures
6. Chronic oral sensory disorders mainly orofacial pain, dysgeusia.
7. Diseases of pulp and periapical tissues, caries.
8. Diseases of periodontium
9. Developmental disturbances of oral and paraoral structures. Odontological diseases.
10. Disorders of temporomandibular joint
11. Disease of the tongue
12. Salivary gland disease
13. Pigmentary disturbances of oral and paraoral region
14. Benign and malignant tumors affecting the oral cavity
15. Cysts of odontogenic origin
16. Tumors of odontogenic origin

17. Acute and chronic infections of oral and paraoral structures. Bacterial, viral and Mycotic infection. Spread of oral infection: oral sepsis and its implications.
18. Metabolic, endocrine and nutritional disorders
19. Immunological disease
20. Bleeding and clotting disorders; Hematological disease
21. Primary and secondary mucosal lesions
22. Premalignant and malignant mucosal lesions
23. Red and white lesions, ulcerative, vesiculobullous lesions
24. Dermatologic, sexually transmitted disease, oral manifestations and management
25. Systemic disease: Oral manifestations and management of
    - 25.1. Diseases of the respiratory system
    - 25.2. Dermatologic diseases
    - 25.3. Hematological diseases
    - 25.4. Immunologic diseases
    - 25.5. Endocrine disease
    - 25.6. Neurologic disease
    - 25.7. Cardiovascular diseases
    - 25.8. Hepatic disease
    - 25.9. Renal disease
    - 25.10. G.I.T diseases
    - 25.11. Reproductive diseases
    - 25.12. Muscular disease
    - 25.13. Urogenital diseases
    - 25.14. Psychological disease
    - 25.15. Geriatric diseases
    - 25.16. Nutritional diseases
    - 25.17. Ophthalmologic disease
    - 25.18. E.N.T.diseases
26. Psychosomatic oral lesions
27. Occupational Hazards
28. General principles of patient care in admitted cases and hospital dentistry
29. Therapeutics in oral medicine

29.1. Medical management of oral disease

29.2. Drugs commonly used in Dentistry – analgesics, anti-inflammatory drugs, antibiotic, steroids, vitamins, minerals, topically used drugs, mouth washes, dentifrices, and desensitizing agents

29.3. Drugs commonly used for medical problems

29.4. Drug interactions

29.5. Oral manifestations of drug reactions and their management

29.6. Medical emergencies in dentistry

30. Legal considerations in Dentistry

31. Forensic Odontology

31.1. Medicolegal aspects of orofacial injuries

31.2. Identification of bite marks.

31.3. Determination of age and sex.

31.4. Identification of cadavers by dental appliances, restorations and tissue remnants.

RADIOLOGY

1. General Physics, Radiobiology, Radiotherapy

1.1. Fundamentals of Dental Radiology

1.1.1. Origin of dental radiology, Historical aspect of radiology.

1.1.2. Radiation physics, Electromagnetic spectrum. Production and properties of X-rays.

1.1.3. Dental X-ray machine parts and factors affecting production of X-ray

1.1.4. X-ray film (intra oral and extra oral)

1.1.5. Film processing – Dark room procedures, Chemicals, processing errors & rectification.

1.1.6. Radiation Biology.

1.2. General Physics

1.3. Radioactivity, radioactive materials, electromagnetic spectrum, production and properties of X-rays, gamma rays, intention of x-rays with matter and its effects. Measures and units of measurement, elementary knowledge of electronics.

1.4. Radiobiology

1.5. General principles, biological effects of radiation, departmental protection, protection measures, filters and filtration, personnel monitoring, dosimetry.

1.6. Radiotherapy

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1.7. Physical principles of radiotherapy, types of therapy source, patient dosage, beam modification, collimations and beam direction devices. Radioactive isotopes.

1.8. Diagnostic Radiology - Physical basis of diagnostic radiology geometric factors, x-ray absorption effects, control of scattered radiation image receptors, image processing, properties of image receptors, Conventional radiography normal landmarks.

1.8.1. Contrast Radiography – Sialography, Arthrography

1.8.2. Xeroradiography - Process of xeroradiography, Dental Application of xeroradiography

1.8.3. Tomography - Principles of Tomography, Conventional Tomography, Curved surface tomography (pantomography) – Evolution, Principles, Interpretation, Panoramic variants, Computed tomography, systems components, interpretation, Dental application. CBCT, PET, SPECT - Dental application, Three dimensional computed tomography

1.8.4. Cephalometric Radiography

1.8.5. Teleradiography, Telemedicine

1.8.6. Ultrasonography - Principles, Dental application

1.8.7. Magnetic Resonance imaging in Dentistry, Basic concepts of analyzing magnetic resonance images.

2. Radiographic Principles and Techniques

2.1. Intra oral radiography

2.1.1. Periapical

2.1.2. Bite –wing

2.1.3. Occlusal

2.1.4. Tube shift technique

2.1.5. In endodontics

2.1.6. In pedodontics

2.1.7. Ideal radiograph

2.1.8. Defective radiographs

2.2. Extra oral radiography – All routine, modified and special views

2.2.1. Of TMJ

2.2.2. Of maxillary sinus

2.2.3. In oral and maxillofacial injuries

2.2.4. Localization techniques

2.3. Contrast radiography

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2.3.1. Sialography

2.3.2. Arthrography

2.3.3. Angiography

2.4. Tomography

2.4.1. Panoramic radiography

2.4.2. Computed tomography

3. CBCT

3.1. Principles of CBCT

3.2. Applications

3.3. Artifacts

4. Radiographic interpretation

4.1. Fundamental principles of radiographic interpretation.

4.2. Normal radiographic anatomy of teeth jaws and normal variations.

4.3. 4.3. Developmental variations and abnormalities of teeth and jaws.

4.4. Acquired abnormalities of teeth and anomalies of eruption.

4.5. Radiology in dental caries, Periodontal diseases

4.6. Radiolucent lesions of jaw bones.

4.7. Mixed lesions of jaw bones

4.8. Radio-opaque lesions of jaw bones.

4.9. Cysts of oral cavity

4.10. Tumours of oral cavity

4.11. Fibro-osseous lesions

4.12. Jaw bone changes

4.12.1. After tooth extraction, trauma radiation

4.12.2. In malignant diseases

4.12.3. Infection of oral cavity

4.12.4. Metabolic and endocrine disease

4.12.5. Hematological and other systemic disease

5. Radiology in

5.1. TMJ diseases

5.2. Maxillary sinus pathologies

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5.3.Oral and Maxillofacial injuries

5.4.Salivary gland disease

6. Principles and technique of therapeutic radiation

7. Osteodystropies

8. Recent advances in

8.1. Radiology

8.2. Digital radiology

8.3. Computed tomography

8.4. Radio-isotopes

8.5. PET.

PROCEDURAL AND OPERATIVE SKILLS:

(The numbers mentioned are minimum to be performed by each candidate)

1st Year

1. Examination of Patient - Case history recordings -100
2. FNAC -50
3. Biopsy -50

   FNAC and Biopsy - Observe, Assist and Perform under supervision (for three years)
4. Intra - oral radiographs- Perform and interpret-100
5. Radiographic tracings of all Intra oral and Extra oral radiographs including TMJ- 2 each.
6. Age assessment by radiographic method :10cases
7. Seminars in basic sciences
8. Journal Clubs
9. Library Dissertation Work
10. Commencement of Dissertation Work.
11. Attending CDE/Workshops/Advanced Courses
12. Attending a State/National Conference and presentation of a Scientific Paper.
13. Publication of a scientific paper

2nd year

1. Dental treatment to medically compromised patient- 50

   - Observe, assist, and perform under supervision
2. Extra - oral radiographs, digital radiography - 50

   - Observe, assist and perform under supervision
3. Intra - oral radiograph-Perform and interpret- 100

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Operative skills:

1. Giving intra - muscular and intravenous injections
2. Administration of oxygen and life saving drugs to the patients
3. Performing basic CPR.
4. Should have attended a minimum of 15 days posting in the following departments.
   4.1. Dermatology and Venereal disease
   4.2. General Radiology
   4.3. Radiation Oncology /Imageology
   4.4. General Medicine
5. 10 seminars in Specialty.
6. Guiding Third year BDS students during their clinical posting.
7. Taking lectures for BDS students on selected topics-10hours.
8. 10 Journal Clubs.
9. Attending CDE/Workshops/Advanced Courses
10. Attending a National Conference and presentation of a Scientific Paper.
11. Completion and Submission of Dissertation.
12. Publication of a scientific paper

3rd Year

1. Perform independently- Case history: Routine cases - 100
2. Documenting of Interesting Cases - 25
3. Intra – oral Radiographs - 100
4. Extra-oral radiographs of different views - 50
5. 10 Seminars on Recent Advances in Dentistry.
6. Attending CDE/Workshops/Advanced Courses
7. Attending a National Conference and presentation of a Scientific Paper.

Monitoring Learning Progress

It is essential to monitor the learning progress to each candidate through continuous appraisal and regular assessment. It not only helps teachers to evaluate students, but also the students to evaluate themselves. The monitoring to be done by the staff of the department based on participation of students in various teaching / learning activities. It may be structured and assessment be done using checklists that assess various aspects

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Library Dissertation: Topic for the library dissertation should be finalized and approved by the end of the first six months and the same to be submitted at the end of the first year. It should be approved by the guide and certified by the Head of the Department.

Conferences and Publication of Scientific Paper: During the MDS course the student should attend two National Conferences and attempts should be made to present at least two scientific papers and publish at least two scientific articles in an indexed journal relevant to the specialty.

The student is expected to maintain a detailed log book of work done on each day of his/her MDS course and should produce it for evaluation on the day of Practical/Clinical Examination.

Requirements to be met by the candidate to appear for MDS examination

1. The candidate should have completed three years training course with a minimum of 80% attendance each year of the course at the time of appearing for the examination.
2. Selection of topic for dissertation should be done within 6 months of the first year and the completed dissertation should be submitted to KUHS six months before the proposed date of examination.
3. Should have attended 15 days posting in the following departments.
   3.1. Dermatology and Venereal disease
   3.2. General Radiology
   3.3. Radiation Oncology /Imageoloy
   3.4. General Medicine.
4. Produce a clinical record with photographs and investigation reports of 15 cases of interest.
5. Produce a record of radiographs of different radiographic techniques
6. Should have undertaken treatment and follow up study of 10 patients with chronic mucosal lesions.
7. Should have attended and presented a paper at state/national conference.
8. Should have at least two publications.
9. Should have 10 hours of undergraduate teaching experience.
10. Should present a compilation of a minimum of 15 seminars; the seminars presented over the course of three years.
11. All records and accounts of work performed by the candidate shall be assessed and approved by the guide for the postgraduate programme.

MDS theory examination shall consist of four papers:

Paper I:Applied anatomy, physiology, pathology and pharmacology.

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Paper II: Diagnosis, diagnostic methods and imageology and Applied Oral Pathology

Paper III: Oral medicine, therapeutics and laboratory investigations

Paper IV: Essay on Oral Medicine and Radiology with Emphasis to recent trends.

Each paper will be based on the relevant aspect (diagnosis, management or imaging) of the topics outline in the syllabus.

*The topics assigned to the different papers are generally evaluated under those sections. However a strict division of the subject may not be possible and some overlapping of topics is inevitable. Students should be prepared to answer overlapping topics.

SCHEME OF EXAMINATION:

The candidate shall be assessed on the basis of the written examination and practical examination and viva voce.

Written examination shall comprise of the four above-mentioned papers, each of three hours duration and maximum marks of 75 each. There will be no options in the questions of the first three papers. The fourth paper will be a three hour essay in which a choice between two questions will be given. It will include all components of course content.

Practical examination (Total Marks 200) will be two days duration comprising of:

Day I:	Detailed examination of a long case	–50marks
	Case presentation of two short cases – 20 marks x 2	- 40marks
	Two spotters – 10 marks x 2	- 20marks
	Exercise in various radiographic techniques	
	Two intraoral radiographs – 10 marks x 2	–20marks
	One Occlusal and Bitewing Radiograph	
	Two extra oral radiograph including	
	technique and interpretation –10 marks x 2	- 20marks
Day II:	Discussion of long case with all required relevant	
	investigation reports.	- 25marks

Assessment of the various records presented by the candidate- 25 marks

Dissertation defense/ Pedagogy -20 marks

Viva Voce(30minutes) -80 marks

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1.1 Total number of hours

As per the instruction given by the DCI

1.2 Branches if any with definition

Oral Medicine and Radiology

1.3 Teaching learning methods

Method of Training

The training of a postgraduate student shall be full time but graded responsibilities in the management and treatment of patients entrusted to his/her care. The participation of the students in all facets of educational process is essential. Every candidate should take part in seminars, group discussions, case demonstrations, clinics, journal review meetings, and clinical meetings. Every candidate shall be required to participate in the teaching and training programme of undergraduate students and interns. Training should include involvement in laboratory and experimental work, and research studies. Every Institution undertaking Post Graduate training programme shall set up an Academic cell or a Curriculum Committee, under the chairmanship of a Senior faculty member, which shall work out the details of the training programme in each speciality in consultation with other Department faculty staff and also coordinate and monitor the implementation of these training Programmes.

Based on the above guidelines for a structured training programme for postgraduate courses, the basic tenets of a successful postgraduate teaching programme, are detailed under the following heads.

- **Formal Lectures** by the faculty on varied subjects including general areas and systems. Both senior and junior faculty can do this. However, the number of these classes should be maintained of low levels to encourage self-learning.
- **Symposia / Seminars** form an integral part of PG learning. A monthly symposium will generate approximate 30-35 symposia / course. These symposia can include department faculty and HODs as chairpersons and maximum involvement of both students and faculty should be ensured.
- **Clinical Discussions** form the core of PG training and can be assigned to various clinical units on rotating basis. However other faculty could also actively participate in the discussion. The discussions must be 3-4/week. One suggestion is to score the performance of the candidate by a small panel of faculty and convey the scores to the candidate / PG at the end of the session.
- **Journal Club /Clinical Club** should be conducted at least once in a week in each postgraduate department. Journal clubs not only imparts new information but also trains the candidate to objectively assess and criticize various articles which come out and should be useful in ensuring evidence based dentistry.

- **Guest Lectures** can be integrated into the PG program at least once in a month. Even the retired faculty can be invited for delivering the lectures and will ensure importing of greater wisdom to the candidates.
- **Orientation Classes** for newcomers should also be incorporated. These classes can even be assigned to junior faculty/senior PGs.
- **Clinical posting.** Each PG student should work in the clinics on regular basis to acquire adequate professional skills and competency in managing various cases to be treated by a specialist.
- **Clinico Pathological Conferences** should be held once a year involving the faculties of Oral Medicine and Radiology, Oral Pathology and concerned clinical department. The student should be encouraged to present the clinical details, radiological and histo- pathological interpretations and participation in the discussions.
- **Rotation postings in other departments** should be worked out by each department in order to bring in more integration between the speciality and allied fields.
- **Periodical Quiz** can be both informative and entertaining and should be encouraged and planned.
- **Computer Training and Internet Applications** are now becoming a must for both faculty and students. These areas should be strengthened as a next step. There can be a sort of internet information club in the departments.
- **Conferences/CDEs** – All postgraduate students should be encouraged to attend conferences and CDEs. They should also be asked to present papers wherever appropriate and should be rewarded by assigning scores for them.
- **Publication of scientific papers** – It is desirable and advisable to have at least two publications in the State/National/International indexed dental journals.
- **Involvement in Teaching Activity** – PG students can be assigned the job of teaching the undergraduate students and these will definitely improve the teaching skills in the postgraduate students.

Examinations

Evaluation is a continuous process, which is based upon criteria developed by the concerned authorities with certain objectives to assess the performance of the learner. This also indirectly helps in the measurement of effectiveness and quality of the concerned MDS programme. Evaluation is achieved by two processes

1) Formative or internal assessment

2) Summative or university examinations.

Formative evaluation is done through a series of tests and examinations conducted periodically by the institution. Summative evaluation is done by the university through examination conducted at the end of the specified course.

A candidate registered for MDS course must clear the final examination within six years of the date of admission. The examinations should be so organized that this shall be used as the mechanism to confirm that the candidate has acquired appropriate knowledge, skill and competence at the end of the training that he/she can act as a specialist and/or a medical teacher as per expectation. University examination will be held regularly by KUHS in April-May/October-November every year.

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A candidate who wishes to study for MDS in a second specialty should have to take the full course of 3 years in that specialty and appear for examinations.

1.4 Content of each subject in each year

Present in clause 2.6

1.5 No: of hours per subject

Present in clause 2.6

1.6 Practical training

Present in clause 2.6

1.7 Records

Present in clause 2.20

1.8 Dissertation: As per Dissertation Regulations of KUHS

Every candidate pursuing MDS degree course is required to carry out work on a selected research project under the guidance of a recognized postgraduate teacher. The results of such a work shall be submitted in the form of a dissertation.

The dissertation is aimed to train a postgraduate student in research methods and techniques. It includes identification of a problem, formulation of a hypothesis, search and review of literature, getting acquainted with recent advances, designing of a research study, collection of data, critical analysis, and comparison of results and drawing conclusions.

Every candidate shall submit to the University in the prescribed format a synopsis containing particulars of proposed dissertation work after obtaining ethical clearance from the Institutional Ethical Committee **within six months from the date of commencement of the course or before the dates notified by the University**. The synopsis shall be sent only through the Principal of the institution.

Such synopsis will be reviewed and the dissertation topic will be registered by the university. No change in the dissertation topic or guide/co-guide shall be made without prior approval of the University. The dissertation should not be just a repetition of a previously undertaken study but it should try to explore some new aspects. The dissertation should be written under the following headings:

1.8.1 Introduction
1.8.2 Aims and Objectives of the study
1.8.3 Review of Literature
1.8.4 Methodology
1.8.5 Results
1.8.6 Discussion
1.8.7 Conclusion
1.8.8 Summary
1.8.9 References
1.8.10 Annexures

The written text of dissertation shall be not less than 50 pages and shall not exceed 150 pages excluding references, tables, questionnaires, and other annexures. It should be neatly typed (font size 13-Times New Roman or font size 13-Cambria) in 1.5 line spacing

on one side of the paper (A4 size, 8.27" x 11.69") and bound properly. Spiral binding should be avoided. (Refer KUHS website). The guide, co-guide if any, Head of the Department and the Head of the Institution shall certify the dissertation.

For uniformity, it was suggested that the colour of the hard bind of the dissertation for all branches of MDS course in the purview of KUHS shall be dark brown with letters of gold colour. The title, author, and year of study should also be imprinted or embossed on the spine of the book. **Three hard copies and one properly labeled soft copy in a CD (refer KUHS website) of the dissertation thus prepared shall be submitted to KUHS on the 29th month of commencement of the course / 31st Oct. of the 3rd academic year, whichever falls first.** Dissertation should preferably be sent to a minimum of three reviewers / examiners /assessors, of which two shall be from out side the state and one from the affiliated colleges o KUHS. If modifications are to be made as specified, three hard copies and one soft copy of the dissertation after corrections made by the candidate should be submitted with in a minimum of 30 days to the University. Consent for acceptance for evaluation of dissertation should be obtained from the reviewer/examiner/assessor before the dissertation are dispatched. Proforma for evaluation of dissertation should be sent along with the copies of the dissertation to the reviewers appointed by the university. The proforma should contain all the assessment criteria with the clause – **Accepted/Accepted with modifications/Rejected** and reasons for rejection by the examiner. This proforma should be sent back to the University within two weeks / within the date specified after receipt of dissertation. The dissertation may be declared accepted if more than 50% of the reviewers (2 in the case of 3 reviewers) have accepted it. If modifications are to be made as specified, 3 hard copies and one soft copy of the dissertation after corrections made by the candidate should be submitted within 30 days to the University which may be sent back to the same examiner/s by the University for Acceptance after a fee has been levied from the candidate. If the dissertation has been rejected by more than 50% of the reviewers (2 in the case of 3 reviewers), the dissertation may be reviewed by an Expert Reviewing Committee comprising of not less than two subject experts, Dean (Research) of KUHS and Guide of the candidate provided the Guide requests for a review, after a fee has been levied from the candidate. If rejected by the Reviewing Committee, the candidate should take up a new topic and undergo all the procedures of submitting the synopsis, fees, IEC clearance, etc as prescribed by the University. The candidate who takes up the new topic can appear only for the subsequent examination.

Approval of dissertation work is an essential precondition for a candidate to appear in the University examination. Hall tickets for the university examination should be issued to the candidate only if the dissertation has been accepted.

A candidate whose dissertation has been accepted by the examiners and approved by the University, but who is declared to have failed at the final examination will be permitted to reappear at the subsequent MDS examination without having to prepare a dissertation.

Guide – The academic qualification and teaching experience required for recognition by the University as a guide for dissertation work is as laid down by the Dental Council of India / KUHS.

Co-guide – A co-guide may be included provided the work requires substantial contribution from the same department or a sister department or from another

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institution recognized for teaching/training by KUHS/DCI. The co-guide should fulfill the academic qualification and teaching experience required for recognition by the University as a co-guide for dissertation work.

Change of Guide – In the event of a registered guide leaving the college for any reason or in the event of death of guide, guide may be changed with prior permission from the University.

1.9 Speciality training if any

Present in clause 2.6

1.10 Project work to be done if any

Present in clause 2.6

1.11 Any other requirements [CME, Paper Publishing etc.]

Present in clause 2.6

1.12 Prescribed/recommended textbooks for each subject

Applied Basic Sciences

SUBJECT	NAME OF AUTHOR	NAME OF BOOK
Anatomy	BD Chaurasia	BD Chaurasia's Human Anatomy
	William, Peter L	Grays Anatomy
Oral Anatomy	Ash, Major M	Wheelers Dental Anatomy, Physiology and Occlosion
	Sicher, Harry, Du Brull , Llyod	Oral Anatomy
Oral Histology	Bhaskar B.N. Ed	Orbans Oral Histology and Embryology
	Avery, James K	Essentials of Oral Histology and Embryology
Embryology	Sadler	Langmans Medical Embryology
	Inderbeer Singh	Human Embryology
Physiology	Guyton Arthur and John L Hall	Text Book of Medical Physiology
	Ganong, William F	Review of Medical Pysiology
Pharmacology	KD Tripathi	Essentials of Medical Pharmachology
	Hardman, Joel G	Goodman and Gillmans pharmacological basis of Therapeutics
Nutrition	Nizel	Nutrition in Preventive Dentistry: Science and Practice
General Pathology	Cotran, Ramzi S and Others	Robbins Pathologic Basis of Disease
	Harsh Mohan	Textbook of Pathology
Oral Pathology	Shaffer, William and Others	Textbook of Oral Pathology
	Neville, Brad W and Others	Oral and Maxillofacial Pathology
Microbiology	Ananthanarayan and Panicker	Textbook of Microbiology
	Lakshman S	Essential Microbiology for Dentistry
	Dr. Symalan	Statistics in Medicine

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Biostatistics	Soben Peter	Essentials of Preventive and Community Dentistry
	Sunder Rao and Richard J.	Introduction to Biostatistics and Research Methods

Oral Medicine and Radiology

Oral Medicine

1. Burket's Oral Medicine – Diagnosis and Treatment –Matin S ,Greenberg 8,9&10,11 ed.
2. A Text book of Oral pathology -Shafer W G ,etal
3. Oral Diseases of the tropics – Prabhu & Wilson
4. Oral and maxillofacial pathology –– Neveille B W et al
5. Internal Medicine for Dentistry – Louis F Rose & Donald Kaye
6. Differential Diagnosis of oral lesions – Wood N K & Goaz PW.
7. Oral Cancer –Jatin Shah
8. Medical Problems in Dentistry –Scully & Cawson

Radiology

1. Fundamental Physics of Radiology -Merdith W J& Massey JB
2. Clarks positioning in Radiography –– R A Swallow
3. Text of Dental and Maxillofacial Radiology – Freny R Karjodkar
4. Panoramic Radiology-Langland O E et al
5. Text book of Oral radiology – White and Pharoah
6. Principles and practice in oral radiographic interpretation – Worth HM
7. Hand Book of signs in Dental and Maxillofacial Radiology- Wood RE
8. Principals and Interpretation ,In Oral Radiology -Goaz P W & White SC.
9. Maxillofacial Imaging –Angilo M Delbaso
10. Principles of Dental Imaging –Baltimore Williams &Wilkins
11. Fundamentals of Dental Radiography-Mason Hing LR

1.13 Reference books

As instructed by HOD

1.14 Journals

Journal of Oral Pathology, Oral Surgery, Oral medicine and Endodontics

Journal of Oral Pathology and Medicine

Journal of Indian Academy of Oral Medicine and Radiology

Journal of American Dental Association

British Dental Journal

Quintessence International

Journal of Canadian Dental Association

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Dental Clinics of North America

Lancet Oncology

Journal of Dental Research

Journal of Cancer Research and Therapeutics

International Journal of cancer

Journal of Head Neck Pathology

American Journal of Roentgenology

Radiologic clinics of North America

Journal of Head and Neck imaging

Dento Maxillofacial Radiology.

1.15 Logbook

- **Work Diary / Log Book**

Logbooks serve as a document of the trainee's work. The trainee shall maintain this Logbook of the special procedures/operations observed/assisted/performed by him/her during the training period right from the point of entry and its authenticity shall be assessed weekly by the concerned Post Graduate Teacher / Head of the Department. This shall be made available to the Board of Examiners for their perusal at the time of his / her appearing at the Final examination. The logbook should record clinical cases seen and presented, procedures and tests performed, seminars, journal club and other presentations. Logbook entries must be qualitative and not merely quantitative, focusing on learning points and recent advances in the area and must include short review of recent literature relevant to the entry. A work diary containing all the various treatment done by the candidate in the course of the study should also be maintained. The work diary shall be scrutinized and certified by both the guide/co guide and Head of the Department and presented in the University practical/clinical examination.

2 EXAMINATIONS

3.1 Eligibility to appear for exams

Every candidate to become eligible to appear for the **MDS examination** shall fulfill the following requirements.

Attendance

Every candidate shall have fulfilled the attendance prescribed by the University during

each academic year of the Postgraduate course. A candidate becomes eligible for writing the University examination only after the completion of 36 months from the date of commencement of the course. The candidates should have completed the training period before the commencement of examination.

Dissertation

Approval of the dissertation is a mandatory requirement for the candidate to appear for the university examination

Library Dissertation

Submission of the library dissertation as per the DCI / KUHS regulations is mandatory for the candidate to appear for the university examination

Progress and Conduct

Every candidate shall have participated in seminars, journal review meetings, symposia, conferences, case presentations, clinics and didactic lectures during each year as designed by the concerned department.

Work Diary and Logbook

Every candidate shall maintain a work diary and logbook for recording his/her participation in the training programmes conducted by the department. The work diary and logbook shall be verified and certified by the Head of the department.

The certification of satisfactory progress by the Head of the Department and Head of the Institution shall be based on checklist given in 5.1 to5.8.

- **Students should note that in case they do not complete the exercises and work allotted to them within the period prescribed, their course requirements will be considered unfulfilled.**
- **Clinical Records, Work Diaries and Logbooks should be maintained regularly and approved by the guide, duly certified by the Head of the Department.**

3.2 Schedule of Regular/Supplementary exams

The MDS examination shall be held at the end of the third academic year. The university shall conduct two examinations in a year at an interval of four to six months between two examinations. **Not more than two examinations shall be conducted in an academic year.**

3.3 Scheme of examination showing maximum marks and minimum marks

- MDS examination will consist of Written(Theory), Viva Voce, and Practical / Clinical examination

Written Examination (Theory):300 Marks

Written examination shall consist of **four question papers**, each of three hours duration. Each paper shall carry 75 marks. The type of questions in the first three papers will be two long essay questions carrying 20 marks each and five short essay questions each carrying ten marks. **There will be no options in the questions in the first 3 papers. Fourth paper will be a single essay question paper which will carry an option and the candidate is to answer only one of the essays.** Questions on recent advances may be asked in any or all the papers. **The syllabus for the theory papers of the concerned specialty should cover the entire field of the subject. Though the topics assigned to the different papers are generally evaluated under designated papers, a strict division of the subject may not be possible**

and some overlapping of topics is inevitable. Students should be prepared to answer overlapping topics. The theory examinations shall be held sufficiently earlier than the practical/clinical examinations so that the answer books can be assessed and evaluated before the start of the practical/clinical examination. The total marks for the theory examination shall be 300.

Practical Examination: 200 Marks

In case of practical examination, it should aim at assessing competence and skills of techniques and procedures. It should also aim at testing student's ability to make relevant and valid observations, interpretation and inference of laboratory or experimental or clinical work relating to his/her subject for undertaking independent work as a specialist. The total mark for practical/clinical examinations shall be 200.

Viva voce ; 100 Marks

Viva voce examination shall aim at assessing depth of knowledge, logical reasoning, confidence and oral communication skills. The candidate may be given a topic for the pedagogy in the beginning of the clinical examination and asked to make a presentation on the topic for 8-10 minutes. The total marks shall be 100 of which 80 would be for the viva voce (20 marks/examiner) and 20 marks for the pedagogy.

3.4 Papers in eachyear

Paper-I- Applied anatomy, physiology, pathology and pharmacology.
PaperII- Diagnosis, diagnostic methods and imageology and Applied OralPathology
Paper-III- Oralmedicine, therapeutics and laboratory investigations
Paper-IV- Essay

3.5 Details of theory exams

Distribution of topics for each paper will be as follows:

PAPER-I*:* Applied Anatomy, Physiology, Biochemistry, Pathology, and Pharmacology.
PAPER-II Oral and Maxillofacial Radiology
PAPER-III- Oral Medicine, therapeutics and laboratory investigations
PAPER-IV- Essay

3.6 .Model Question Papers

MDS – Oral Medicine and Radiology

Paper 1 – Applied anatomy, physiology, pathology and pharmacology.

(Answer all questions)

Time: 3 hrs Max marks:75

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Long Essay **(2 x 20 = 40)**

1. Describe the muscles, nerve supply, blood supply and lymphatic drainage of Tongue. (5+5+5+5=20)
2. Define osteomyelitis. Discuss the etiology, pathogenesis, clinical features and radiographic appearance of chronic osteomyelitis of the mandible. (3+3+3+3+8 = 20)

Short Essays **(5 x 7 = 35)**

3. Hypersesitivity reactions
4. Principles of radiographic interpretation
5. TNM staining
6. Actinomycosis
7. Calcium metabolism

Paper II : : Diagnosis, diagnostic methods and imageology and Applied Oral Pathology.

(Answer all questions)

Time: 3 hrs Max marks : 75

Long Essay **(2 x 20 = 40 marks)**

1.Describe in detail radiographic appearances seen in primary and metastatic malignancies affecting the jaws. (15+5=20)

2.Describe conventional and advanced imaging techniques for Temporomandibular joints. (10+10=20)

Short essays **(5 x 7 = 35 marks)**

3 Filters used in diagnostic radiography
4. Radiovisiography
5. Radiographic appearance of scelorising type of osteomyelitis affecting the jaws.
6. Drawbacks of panoramic radiographs
7. Safelight used in dark room.

Paper III – Oral medicine, therapeutics and laboratory investigations.

(Answer all questions)

Time: 3 hrs Max marks :75

Long Essay **(2 x 20 = 20 marks)**

1.Discuss radiotherapy for oral cancer in detail. Add a note on the complications of radiotherapy and its management.
(10 10 = 20 marks)

2. Describe the etiology, clinical features and medical management of oral lichen planus. Discuss briefly on lichenoid reactions. (5+ 5+5+5= 20 marks)

Short Essays **(5 x 7 = 35 marks)**

3. Cyclic Neutropenia
4. Recurrent aphthous stomatitis.
5. Clinical features and treatment of Erythema multiforme.
6. Methods for personal identification in forensic odontology
7. Dental management of diabetic patient

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Paper IV – Essay on Oral Medicine and Radiology with Emphasis to recent trends.

(Answer any one question)

Time: 3 hrs Max marks : 75

Ultrasonography in dentistry

OR

Diagnosis of Premalignant mucosal lesions

3.7 Internal assessment component

Not applicable.

3.8 Details of practical/clinical exams

Practical examination (Total Marks 200) will be two days duration comprising of:

Day I: Detailed examination of a long case – 50marks

Case presentation of two short cases – (15 marks x 2) - 30marks

Two spotters – (10 marks x2) - 20marks

Exercise in various radiographic techniques

Two intraoral radiographs – (10 marks x 2) – 20marks

One Occlusal and Bitewing Radiograph – 15 marks x 2 – 30 marks

Two extra oral radiograph including technique and interpretation –15 marks x 2 - 30marks

Day II:

Discussion of long case with all required relevant investigation reports. - 20 marks

Assessment of the various records presented by the candidate

Dissertation defense/Pedagogy -20marks

Viva Voce(30minutes) -80marks

3.9 Number of examiners needed (Internal & External) and their qualifications

There shall be at least four examiners in each branch of study. Out of four, two (50%) should be external examiners and two shall be internal examiners. The qualification and teaching experience for appointment as an examiner shall be as laid down by the DCI. The external examiners shall ordinarily be invited from another recognized University from outside the state. An external examiner may ordinarily be appointed for the same institute for not more than two years consecutively. Thereafter he may be reappointed after an interval of one year. The same set of examiners shall ordinarily be responsible for the practical and oral part of the examination.

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The Head of the Department shall ordinarily be one of the examiners and the chairperson of the Board of Examinations; second internal examiner shall rotate after every two consecutive examinations if there are more than two postgraduate teachers in the department other than the Head of the department. No person who is not an active Postgraduate teacher in that subject can be appointed as Examiner. However in case of retired personnel, a teacher who satisfies the above conditions could be appointed as examiner up to one year after retirement.

For the MDS examination, if there are no two qualified internal examiners in an institute the second internal examiner can be from a neighbouring DCI and KUHS approved / recognized Dental College having PG course in the specific speciality. This examiner should be an active PG teacher in the same speciality with the qualifications and experience recommended for a teacher for postgraduate degree programme. The examination can also be conducted by one qualified internal examiner and three qualified external examiners if there is no qualified second internal examiner.

Reciprocal arrangement of Examiners should be discouraged, in that, the internal examiner in a subject should not accept external examinership of a college from which the external examiner is appointed in his subject in the same academic year.

3.10 Details of viva

Viva Voce :100 Marks

i. Viva-Voce examination :80marks

All examiners will conduct viva-voce conjointly on candidate's comprehension, analytical approach, expression, interpretation of data and communication skills. It includes all components of course contents. It includes presentation and discussion on dissertation also.

ii. Pedagogy and thesis presentation : 10 +10 = 20marks

4. INTERNSHIP Not applicable for PG courses

5. ANNEXURES

5.Check Lists for Monitoring: Log Book, Seminar Assessment etc.

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CHECKLISTS and LOGBOOK

5.1Checklist 1

Model Checklist for Evaluation of Preclinical Exercises

Nameof Student: Date:

Name of the Faculty-in-charge:

Name of Exercise

Sl. No:	Items for observation during evaluation	Score
1	Quality of Exercise	
2	Ability to answer to questions	
3	Punctuality in submission of exercise	
4	TOTAL SCORE	

Performance	Score
Poor	0
Below Average	1
Average	2
Good	3
Very good	4

Signature of Faculty-in-charge

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5.2:Checklist 2

Model Checklist for Evaluation of Journal Review / Seminar Presentation

Name of Student: Date:

Name of the Faculty/Observer:

Name of Journal / Seminar:

Sl. No:	Items for observation during evaluation	Score
1	Relevance of Topic	
2	Appropriate Cross references	
3	Completeness of Preparation	
4	Ability to respond to questions	
5	Effectiveness of Audio-visual aids used	
6	Time Scheduling	
7	Clarity of Presentation	
8	Overall performance	
9	TOTAL SCORE	

Performance	Score
Poor	0
Below Average	1
Average	2
Good	3
Very good	4

Signature of Faculty/Observer

☆

5.3:Checklist 3

Model Checklist for Evaluation of Clinical Case and Clinical Work

Name of Student:

Name of the Faculty/Observer: Date:

Sl. No:	Items for observation during evaluation	Score
1	History	
	Elicitation	
	Completeness	
2	Examination	
	General Examination	
	Extra oral examination	
	Intraoral examination	
3	Provisional Diagnosis	
4	Investigation	
	Complete and Relevant	
	Interpretation	
5	Diagnosis	
	Ability to defend diagnosis	
6	Differential Diagnosis	
	Ability to justify differential diagnosis	
7	Treatment Plan	
	Accuracy	
	Priority order	
8	Management	
9	Overall Observation	
	Chair side manners	
	Rapport with patient	
	Maintenance of Case Record	
	Quality of Clinical Work	
	Presentation of Completed Case	
10	TOTAL SCORE	

Performance	Score
Poor	0
Below Average	1
Average	2
Good	3
Very good	4

Signature of Faculty/Observer

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5.4:Checklist 4

Model Checklist for Evaluation of Library Dissertation Work

Name of Student: Date:

Name of the Faculty/Guide:

Sl. No:	Items for observation during evaluation	Score
1	Interest shown in selecting topic	
2	Relevance of Topic	
3	Preparation of Proforma	
4	Appropriate review	
5	Appropriate Cross references	
6	Periodic consultation with guide	
7	Completeness of Preparation	
8	Ability to respond to questions	
9	Quality of final output	
9	TOTAL SCORE	

Performance	Score
Poor	0
Below Average	1
Average	2
Good	3
Very good	4

Signature of Faculty/Guide

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5.5:Checklist 5

Model Checklist for Evaluation of Dissertation Work

Name of Student: Date:

Name of the Faculty/Guide/Co-guide:

Sl. No:	Items for observation during evaluation	Score	Performance	Score
1	Interest shown in selecting topic		Poor	0
2	Relevance of Topic		Below Average	1
3	Preparation of Proforma		Average	2
4	Appropriate review		Good	3
5	Appropriate Cross references		Very good	4
6	Periodic consultation with guide/co- guide			
7	Depth of Analysis / Discuss			
8	Ability to respond to questions			
9	Department Presentation of findings			
10	Quality of final output			
	TOTAL SCORE			

Signature of Faculty/Guide/Co-guide

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5.6:CHECKLIST-6

CONTINUOUS EVALUATION OF DISSERTATION WORK BY GUIDE/CO-GUIDE

Name of the Trainee: Date

Name of the Faculty/Observer:

SI.No.	Items for observation during presentation	Poor 0	Below Average 1	Average 2	Good 3	Very Good 4
1.	Periodic consultation with guide / co- guide					
2.	Regular collection of case material					
3.	Depth of Analysis / Discussion					
4.	Department presentation of findings					
5.	Quality of final output					
6.	Others					
	Total score					

Signature of the guide / co-guide

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5.7 CHECK LIST -7

OVERALL ASSESSMENT SHEET

Name of the College: Date:

Name of Department:

Check List No	PARTICULARS	Name of trainee		
		First Year	Second Year	Third Year
1	Preclinical Exercises			
2.	Journal Review Presentation			
3.	Seminars			
4	Library dissertation			
5.	Clinical work			
6-	Clinical presentation			
7.	Teaching skill practice			
8.	Dissertation			
	TOTAL			

Signatureof HOD **Signature of Principal**

The above overall assessment sheet used along with the logbook should form the basis for certifying satisfactory completion of course of study, in addition to the attendance requirement.

Key:

Mean score: Is the sum of all the scores of checklists 1 to 6

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5.8:LOGBOOK

DEPARTMENT OF ……..

MDS Programme

LOG BOOK OF

NAME…….

BIODATA OF THE CANDIDATE

EXPERIENCE BEFORE JOINING P.G. COURSE

DETAILS OF POSTING :

- **FIRST YEAR**
- **SECOND YEAR**
- **THIRD YEAR**

DETAILS OF LEAVE AVAILED

PRECLINICAL EXERCISES

LIBRARY DISSERTATION

RESEARCH WORK

PARTICIPATION IN CONFERENCES – CDE PROGRAMMES

DETAILS OF PARTICIPATION IN ACADEMIC PROGRAMME

SEMINARS /SYMPOSIA PRESENTED

JOURNAL CLUBS

TEACHING ASSIGNMENTS – UNDERGRADUATES / PARAMEDICAL.

SPECIAL DUTIES (IF ANY)

INTERNAL ASSESSMENT

DAILY ACTIVITIES RECORD (BLANK PAGES)

ONE PAGE FOR EACH MONTH X 36 PAGES

MISCELLANEOUS

SUMMARY

☆

5.8.1 :LOGBOOK-1

ACADEMIC ACTIVITIES ATTENDED

Name:

Admission Year: College:

Date	Type of activity - Specify Seminar, Journal club, Presentation, UG teaching	Particulars

☆

5.8.2 :LOG BOOK -2

ACADEMIC PRESENTATIONS MADE BY THE TRAINEE

Name :

Admission Year:

College:

Date	Topic	Type of activity - Specify Seminar, Journal club, Presentation, UG teaching

DIAGNOSTIC AND OPERATIVE PROCEDURES PERFORMED

5.8.3 LOGBOOK-

Name

Admission Year:

College:

Date	Name	OP No.	Procedure	Category **0,** A, PA, PI

Key:

O- WASHED UP AND OBSERVED - INITIAL 6 MONTHS OF ADMISSION

A-ASSISTED A MORE SENIOR SURGEON -1 YEAR MDS

PA - PERFORMED PROCEDURE UNDER THE DIRECT SUPERVISION OF A SENIOR SURGEON - II YEAR MDS

PI-PERFORMED INDEPENDENTLY - III YEAR MDS

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Recognised by Dental Council of India and Govt. of India
KMCT Medical College Campus, Mukkam, Kozhikode-673602
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Sample for various tools for assessing student's attainment levels.

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UG RESEARCH REPORT

\To stimulate the scientific minds of undergraduate students and help them to understand the intricacies of conducting evidence based scientific research, a novel initiative by KMCT Dental College "Undergraduate short term research program" (UGRP) was introduced for the 2019 batch of interns. The Committee formed to coordinate the undergraduate research program comprised of Research Coordinator, Dr Auswaf Ahsan, H.O.D, Department of Oral Medicine, Dr Manoj Vengal, Professor, Department of Oral Medicine and Dr Dhanya Muralidharan, H.O.D, Department of Public Health Dentistry. A team of enthusiastic mentors from each department was designated to guide the allotted interns through their research work.

The first phase was Orientation on "Need for Undergraduate Research" by Dr Auswaf Ahsan, H.O.D, Department of Oral Medicine and on "How to conduct research" by Dr Manoj Vengal, Professor, Department of Oral Medicine and "Guidelines for UGRP Research proposal" by Dr Dhanya Muralidharan for students and Mentors on 5th April 2019. Following which the Research Committee on 13th May 2019 evaluated the progress of work done for UGRP and scheduled the date for scientific review of the research proposals. The second phase saw an enthusiastic team of KMCT students, steered by their mentors, presented their research synopses which focused on the various aspects of oral health, patient welfare, material science and technological innovations pertaining to different branches of dentistry on 19th July. The research synopsis presentation convened by Dr Auswaf Ahsan and Dr Dhanya Muralidharan, was inaugurated by Principal Dr Manoj Kumar KP. The Committee tasked with reviewing the students proposals for its scientific merit and ethical clearance was Vice Principal, Dr Nizarosiyo RK, Dr Prathyusha P, H.O.D, department of Pedodontics andDr Harish Kumar VV, H.O.D, department of Periodontics. The students also had a session on statistical soft wares used in research by Dr Arun Paul, faculty, department of Public Health Dentistry.

The students presently are in phase three of their research work, where in their proposals are modified according to the suggestions of the scientific committee and are ready to go for the execution phase of their proposals. Short term research work will improve the student's to develop critical and logical thinking skills and pave way for numerous paper presentations and scientific publications.

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Committee Evaluation- 13th May 2019



Scientific Committee Review- 19th July 2019

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Ref: KMCT/DC/2019/139

Date: 27/03/2019

PROCEEDINGS OF THE PRINCIPAL

SUB: UNDERGRADUATE RESEARCH PROGRAM COMMITTEE

The scientific committee constituted to coordinate and review undergraduate research proposals for its scientific soundness, technical appropriateness and ethical approval and conduct of research has been constituted as follows:

1. **Dr Auswaf Ahsan (Co-ordinator)**
   Professor and H.O.D
   Department of Oral Medicine and Radiology
   KMCT Dental College
   Kozhikode
   Mob: 9895080789
2. **Dr Manoj Vengal (Member)**
   Professor
   Department of Oral Medicine and Radiology
   KMCT Dental College
   Kozhikode
   Mob: 9446475139
3. **Dr Dhanya Muralidharan (Member)**
   Reader and H.O.D
   Department of Public Health Dentistry
   KMCT Dental College
   Kozhikode
   Mob: 8281031234

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Copy to:

1. All HODs
2. Vice principal
3. AO 4.Fle

PRINCIPAL
DR. MANOJ KUMAR. K.P
Principal
KMCT Dental College
Manassery, Mukkam

SEMINAR PRESENTATIONS

Date	Presentations	Presenter	Signature
12/3/19	IC - A Comparative assessment of intra nasal and oral dexmedetomidine for procedural sedation in Pedeutric Patients.	ANN	
13/9/19	IC - Comparison of Endoflas and ZOE as root canal filling materials in primary dentition.	RISANA K	
14/3/19	IC - Sealing ability of MTA plus and Biodentine for repair of furcal perforation in primary molars.	RASNA K.	
26/03/2019	Conscious sedation - part I	Ann Johnson	
27/03/2019	IC - An invitro evaluation of Ni and Cr release from different commercially available stainless steel crowns	Thushar	
2/04/19	Conscious sedation part 2 (Seminar)	Ann	

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Date	Presentation	Presenter	Signature
16/4/19	Prosthodontic Rehabilitation in Children.	AMAL	
30/04/19	Seminar Disease Burden of Dental Caries in Indian children	AFROZA K K	
1/05/19	National Oral Health Policy	LAKNA M T	
2/5/19	Seminar – fluoride controversies	Swetha	
3/5/19	case presentation	Thasha	
7/5/19	Seminar – fluoride scenario in India and critical evaluation of water fluoridation	Thusha	
8			
8/5/19	JC- Spectrophotometric evaluation of white spot lesion treatment using novel resin infiltration material (ICON)	Anu	
10			
9/5/19	Seminar – fluoride scenario in India and critical evaluation of water fluoridation – Part 2	Thusha	
15/5/19	Seminar : Application of nanoscience in pedodontics (part 1)	Nazeen Ayeib K	
16/5/19	JC - Remineralising potential of commercially available pediatric dentifrices - an invitro study	Rasna K.	

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Date	Presentation	Presenter	Signature
~~22/5/2019~~ 20/5/2019	Seminar : Application of nanoscience in pedodontics (part 2)	Nazeen	
23/5/2019	JC : Antibacterial effect & physical properties of chitosan & chlorhexidine-cetrimide modified GIC	Risana	
28/5/2019	Seminar : Avulsion & its management (part 1)	Rasna	
29/5/2019	JC : Clinical, Radiological & histological assessment of magnetic nanoparticles as pulpotomy medicaments in primary molars	Thusha	
30/5/2019	Pedagogy : Pulpotomy medicaments	Nazeen	
31/5/19	Seminar : Avulsion & its management Part 2	Rasna. K.	
4/6/2019	Seminar Caries Diagnosis Part 1	Swetha	
6/6/2019	JC : Influence of storage media and duration of fragment in the media on the bond strength of reattached tooth fragment	Ann.	

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Date	Presentation	Presenter	Signature
7/6/19	JC: Salivary proteins - A barrier on enamel demineralst^n - An invitro study	Rasna. K.	
14/6/19	Seminar: Caries Diagnosis Part II	Swetha	
14/6/19	JC: Efficacy of probiotics and Green tea mouth rinse on Salivary pH	RISANA	
19/6/19	Pedagogy: MIH	NAZREEN AYOOB	
26/6/19	CP: Thumb sucking	Swetha.	
~~26/6/19~~			
3/7/19	Seminar: Mixed dentition Analysis	ANN.	
~~3/7/19~~			
5/7/19	Seminar: Obturating materials	RISANA.	
8/7/19	Seminar: Nerve Supply of Head & Neck region	SANGEETHA. CR	
10/7/19	JC: How effective are INB and Supplemental intra ligamentary Inject^n in Pediatric Patients with deep Carions pmnt Mand. molars	Swetha.	
11/7/19	CP: Lip biting & Thumb sucking habit	ANN	

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15/7/19.	Seminar - lymphatic drainage of head & neck.	Aparna AP	
16/7/19.	Seminar - Ephebodontics	Nazeem	
17/9/19	JC - Comparison of Vit D level of children with & without caries	Rasna	
18/7/19	Case presentation - Anterior esthetic rehabilitation	Ricana	
19/7/19.	Seminar - Sports Dentistry Part I	Thusha	
20/7/19.	Seminar - Sports dentistry Part II	Thusha	
22/7/19.	Seminar - Blood Supply of head & neck	Reshma Reshma	
23/7/19.	Seminar - Endodontic Instruments	Swetha	
24/7/19.	JC - Clinical evaluation of b/w Ricoris & SSC in primary molars teeth	Nazeem	
25/7/19.	JC Assessment of Quality of Obturation, Instrumentation Time & Intensity of Pain with pediatric rotary file (Kedo-S) in primary anterior teeth: A randomized controlled clinical trial	Risana	

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DATE	PRESENTATION	PRESENTER	SIGNATURE
26/7/19	Seminar GIC - 1 Part I	Rasna. K	
27/7/19	Seminar Inflammation & its clinical application	Sangeetha C.R CR1	
31/7/19	JC - Comparative evaluation of radiographic and clinical success of three different LSTR techniques on treatment options in primary molars requiring pulpectomy	Swetha S. Nair	
01/08/2019	Seminar - Innate, Passive, Active Immunity - Part I	Aparna Sivaraman AP	
02/8/2019	Seminar GIC - Part II	Rasna. K.	
06/8/2019	Seminar - Innate, Passive, Active Immunity - Part I	Aparna AP	
08/8/2019?	JC - Salivary proteins - A Barrier on enamel demineralisation - an invitro study	Rasna. K.	16/08/19
16/8/19	Seminar - Ozone Applications in Dentistry.	Nazeem Ayub K	
17/08/2019	Seminar - Maxillary Nerve	Reshma Resh	
19/08/2019	Seminar - Amelogenesis	Sangeetha C.R CR1	

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DATE	PRESENTATION	PRESENTER	SIGN
20/08/2019	Seminar : LSTR part 1	Risana	
22/08/19	Case Presentation : Supplemental Tooth	Thusha	
24/08/19	Seminar : Brazing, Soldering & Welding	Aparna AP	
31/8/19	Mandibular nerve	Reshma	
2/9/2019	[redacted] - [redacted] → Seminar - Dental Pulp	[redacted] Sanjana CR	
3/9/2019	JC : Safety and efficacy of 3 pediatric midazolam moderate sedating regimens	Swetha	
13/9/19	Seminar : Maternal influences on child's behaviour	Ann	
14/9/19	Seminar : Vit D & calcium homeostasis and its clinical application	Aparna AP	
17/9/19	JC : Antimicrobial efficacy of nanosilver and chitosan against S.mutans, as an ingredient of toothpaste formulation : An invitro study	Nazeen	

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DATE	PRESENTATION	PRESENTER	SIGN
19/9/2019	JC - Comparative evaluation of the fracture Strength of pulpotomised primary molars - An invitro study	Risana	
20/9/19.	Case presentations - Spacing b/w upper anteriors due to palatally impacted mesiodens	Rasna.	
23/9/19	Seminar - Pain pathway & theories of pain	Reshma Rasna	
24/9/19	Seminar : dental amalgam & its controversies - Part I	Sangeetha	
25/9/19	Seminar - Survey Designs	Thusha	
26/9/19	JC - effect of intra operative analgesia in children's pain perception during recovery after painful dental procedure performed under G.A.	Ann	
27/9/19	Seminar - Sampling in research methodology	Rasna	
28/9/19.	Pedagogy - Space maintainers	Nazeem	

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DATE	PRESENTATION	PRESENTER	SIGN
01/10/2019	Dental amalgam & Cariostatics - PART II	SANDEETHA C R	
02/10/19	Seminar on - Epidemiological study designs	Swetha S Nair	
3/10/19	JC - Comparative evaluation of effects of human breast milk & plain and probiotic-containing infant formulas on enamel & mineral content in primary teeth : an invitro study	Nazeem Ayub K	
4/10/19	Seminar - Child psychology - Introduction and psychoanalytical theory	Anu	
5/10/19	pedagogy - Host defence mechanism	Thusha	
10/10/19	JC - Impact of 6% citric acid and endoactivator as irrigation adjuncts on obturation quality and pulpectomy outcome in primary teeth	Risana Rana	
9/10/19	Seminar - Intracanal medicaments - part 3	Risana	
15/10/19	Seminar - Oral microflora from birth to adolescence	Aparna	

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DATE	PRESENTATION	PRESENTER	SIGN
18/10/19	Seminar – Intracanal medicaments – part II	Risana	
17/10/19	JC – Banded Vs Single sided bonded space maintainers : A comparative study	Risana	
19/10/19	pedagogy – Age changes of maxilla and mandible	Sweetha	
21/10/19	Seminar – Development of face	Reshma Resh	
22/10/19	Seminar – Genowonspects	Sangeetha CKS	
24/10/19	JC – Comparison of resorption rate of 1° teeth treated with alternative LSTR & conventional endodontic treatment: An invivo randomized clinical trial	Nazeem.	
25/10/19	Seminar – child psychology: Psychosocial theory.	Thusha.	
26/10/19	Debate/discussion – type of post endodontic restorations given depending on cases.	All Pgs	
18/11/19	Seminar – Plaque as biofilm	Aparna. AP	

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Date	Presentation	Presenter	Sign
20/11/19	Seminar - Endodontic irrigants (Part 1)	Nazeen.	
27/11/19	Seminar - Endodontic irrigants (Part 2).	Nazeen.	
28/11/19	JC - A Regenerative Approach for Root Canal Treatment of mature Permanent Teeth: Comparative Evaluation with 18 months Follow up.	Swetha	
1/12/19	Pulp Revascularisation	Risana.	
2/12/19	Theories of Growth	Reshma Basi	
5/12/19	JC - Evaluation of effect of warm L.A on pain perception during dental injections in children: a split-mouth randomized clinical trial.	Nazeen.	
6/12/19	Seminar :- Cognitive Development Theory	Rasna. K.	
7/12/19	Pedagogy - Anticipatory Guidance	Risana K.	
10/12/19	Seminar - Pedodontic Practice management	Sangeetha CR	21/12/19

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Date	Presentation	Presenter	Sign
11/12/19	Seminar - Space Regainers	Ann	
12/12/19	Seminar - Space maintainers	Swetha	
13/12/19	JC - Efficacy of Endo ice followed by intrapulpal ice application as adjunct to IANB in patients with SIP.	Swetha	
14/12/19	Pedagogy - Kedofile Systems	Thusha	
16/12/19	Seminar - classical conditioning Theory	Thusha	
19/12/19	JC - A clinico radiographic comparison of the effects of platelet rich fibrin gel and platelet rich fibrin membrane as scaffolds in the apexification treatment of young permanent teeth	Rasna. K.	
20/12/2019	Evaluation of mixture of zinc oxide - 10% NaF as novel root canal filling material: A pilot study	Ann	
06/01/2020	Age Changes of mandible	Aparna AP	21/12/20
9/1/2020.	JC. Clinical efficacy of HCl and H_3PO_4 in micro abrasion technique for the treatment of different severities of dental fluorosis - An In vivo Comparative	Rasna. K.	

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11/1/2020 13/1/2020	SEMINAR - EATING DISORDERS	RUSANA	
15-1-'20.	Seminar - Forensic Odontology - Part 1	Nazeem.	
16-1-'20.	JC - Retention of pit & fissure sealant v/s flowable composite An invivo 1yr comparative evaluation	Thusha.	
18/01/2020	Plaque As a Biofilm	Aparna AP	21/02/20
28-1-20.	SEMINAR - Age estimation methods	Reshma. Rest	
29-1-'20.	Seminar - Forensic odontology - Part 2.	Nazeem.	
31/01/2020	JC - Combined effect of Enamel deproteinization & intermediate bonding in the retention of pit & fissure sealants in children - A RCT	Rasna.	
11/02/2020	Seminar - Interruption of tongue thrusting habit	Thusha	
12/02/2020	Pedagogy - Resin infiltration technique	Nazeem	
13/02/2020	JC - effectiveness of topical hyperosmolar as a hemostatic agent in children undergoing extraction of primary teeth - Triplik-mouth, randomized, double blind cross-over clinical	Anu	

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Date	Presentation	Student	Signature
18.02.20	Seminar: Dental health Education	Rasna	
21.02.20	Seminar: Saliva Part 1	Sangeetha CRS	
26.02.20	JC: Clinical & Radiographic Evaluation of 3Mix & Vitapex as pulpectomy medicament in 1° molars: An in-vivo study	Thusha	
03.03.20	Seminar: Saliva Part 2	Sangeetha CRS	
06.03.20	Seminar: Saliva Part 3	Sangeetha CRS	
10.03.20	Seminar: Development of Tongue	Aparna AP	
12.3.2020	JC: Clinical performance of Indirect composite onlays as Esthetic Alternative to SSC for Rehabilitation of Large carious 1° molar	Risana.	
13-3-20.	Seminar - Types of hypersensitivity reactions - Part 1	Reshma Resh	
17-3-20	Seminar - Types of hypersensitivity reactions - Part 2.	Reshma Resh	

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18-3-2020	Case Presentation on 'Ectodermal dysplasia'	Swetha	
20-3-2020	Seminar - Caries Vaccine Part I	Risana	
21-3-2020	IC - Comparative Study b/w Revitalization of Necrotic Immature Permanent Anterior Teeth With & without PRF : A Randomized Controlled Trial. (LOCKDOWN).	Nazreen	
2-4-2020	IC Retention & remineralization effect of moisture tolerant resin based sealant & GI sealant on non-cavitated pit & fissure caries : RCelinical trial.	Dr. Aparna.	
9-4-2020	IC Remineralization potential of dentifrice containing nanohydroxyapatite on artificial carious lesions of enamel : A comparative invitro study.	Dr. Sangeetha.	
16-4-2020	IC Comparative evaluation of bioactive glass v/s CHX & RMGIC & Ca-hydroxide as IPC materials in primary molars. An in vitro study.	Dr. Reshma.	

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18/4/20	JC - A Randomized controlled Tx Clinical Trial comparing Tricalcium silicate & formocresol pulpotomies followed for 2-4 yrs.	Swetha	
28/4/'20	JC - Effect of Ca-hydroxide as a root canal dressing material on dentin fracture strength in 1° teeth - In vitro study.	Risana	
2/5/'20	JC - Clinical & radiographic evaluation of 4 different Z.O - integrated root canal obturating materials used in primary teeth	Nazreen	
7/5/'20	JC - ~~Eva~~ Comparative evaluation of efficacy of CHX, sod. hypochlorite, diode laser & saline in reducing microbial count in primary teeth root canals - An in vivo study.	Aparna AP	
9/5/20	JC - Microbiological Evaluation of ozone on dentinal lesions in young permanent molars using Stepwise excavation.	Sangeetha CR1	

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14/5/'20	-IC- Comparative evaluation of remineralizing efficacy of biomimetic self-assembling peptide on artificially induced enamel lesions: An invitro study	Reshma Resh	
16/5/'20	-IC- Relationship b/w molar deciduous teeth infraocclusion & maxd. growth: A case-control study	Swetha	
23/5/'20	-IC- Antioxidant mix: A novel pulpotomy medicament: A scanning electron microscopy evaluation.	Risana	
21/5/'20 →	-IC- Evaluation of clinical effectiveness & patient acceptance of Hall technique for managing carious primary molars: An invitro study	Nazeem	
2/6/'20	Pedagogy - SDF	Anu	
4/6/'20	Pedagogy - Slow releasing fluoride devices.	Thusha	
8/6/'20	Pedagogy - Probiotics	Rasna	
10/6/'20	Pedagogy - Zirconia crown	Anu	

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12/6/'20	Pedagogy - Newer drug delivery systems in dentistry	Rama.	
15/6/'20	Pedagogy - Smart materials	Thusha.	
20/6/'20	JC - MTA for treatment of external root resorption in an avulsed immature teeth: 10 yrs of follow up.	Aparna. AP	
24/6/'20	JC - Foggy mouth: a new myofunctional approach to atypical swallowing.	Sangeetha CKI	
30/6/'20	JC — Spectrophotometric evaluation of colour changes in tooth enamel defects using resin infiltrate	Reshma. Rsh	
3/7/'20 (from department)	Seminar - Sequelae of trauma Part 1	Nazeem.	
7/7/'20	Seminar - Sequelae of trauma Part 2	Nazeeem.	
9/7/'20	Seminar 'Pit & fissure sealants' - Part 1	Swetha.	
13/7/'20	Seminar - Pit & fissure sealants' - Part 2.	Swetha.	

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28/7/20	Seminar - Ethics in dentistry - Part 1	Risana	
29/7/20	Seminar - Ethics in dentistry - Part 2	Risana	
30/7/20	JC - Treatment & low sodium fluoride on wound healing & the osteogenic differentiation of bone marrow mesenchymal stem cells.	Aparna	
4/8/20	Seminar - 'Oral habits' part 1.	Sangeetha CH	
5/8/20	JC - Effect of an oral spray containing an aqueous extract of Triticum vulgare on dental plaque & gingival inflammation in school children : A randomized controlled trial.	Swetha	
6/8/20	Seminar - 'Oral habits (part 2) (Thumb Sucking)	Sangeetha CH	
11/8/20	Seminar - 'Oral habits' (part 3)	Sangeetha	
12/8/20	Seminar - Activator (part 1)	Nazreen	

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13/8/20	JC - Comparative evaluation of pain perception following topical application of benzocaine gel, clove-papaya based anesthetic gel & precooling of injection site before infra-oral injections in children.	Reshma. Resh.	rfr
14/8/20	Seminar - 'Activator (part 2)	Nazeen.	rfr
18/8/20	Seminar - 'developmental oral pathological conditions in children' (part 1)	Aparna. Ap	
19/8/20	Seminar - Developmental oral pathological conditions in children' (part 2)	Aparna. Ap	
20/8/20	JC - 'COVID-19: characteristics in children & considerations for dentists providing their care.	Nazeen	
21/8/20	Seminar - 'Orthopaedic appliances' (part 1)	Swetha.	rfr
25/8/20	Seminar PROBIOTICS (Part I)	Reshma Resh	Rest.
2/9/20	JC Cephalometric assessment of dentoskeletal characteristics in children with digit-sucking habit	Sangeetha (CK)	

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Date			
30/2/20	Seminar: PROBIOTICS part - II	Reshma Resh	
4/9/20	Seminar: TOOTH BANKING	RISANA	
8/9/20	JC - comparative evaluation of C.S. of 2 different pot systems	Reshma Resh	
7/9/20	Seminar: Managemt of Special child - I	Nazeen	
9/9/20	Seminar: management of special child - part II	Nazeen	
23/9/20	SEMINAR: INTERCEPTIVE ORTHODONTICS - PART-I (Introduction & Midline Diastema)	APARNA AP	
24/9/20	Seminar: Interceptive - Midline Diastema (Part 2)	Aparna AP	
26/9/20	DISCUSSION - FACE MASK	All PG's	
28/9/20	SEMINAR - SERIAL EXTRACTION (Interceptive Orthodontics)	RESHMA Resh	
29/9/2020	SEMINAR - Special Child Part3 (Mental Retardation)	Nazeen	
1/10/2020	SEMINAR - 'Dental management of autistic child' - 1	Swetha	
30/9/2020	SEMINAR - 'Dental management of children with Cerebral Palsy'	Risana	

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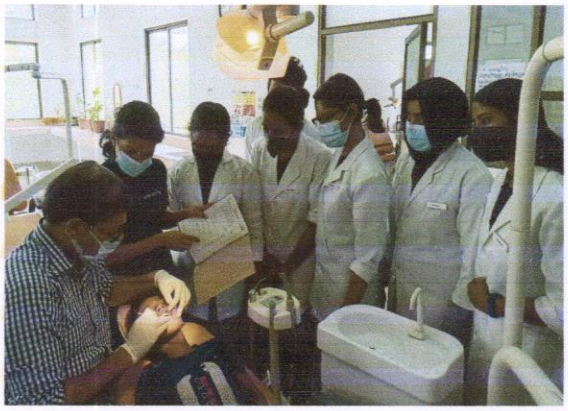
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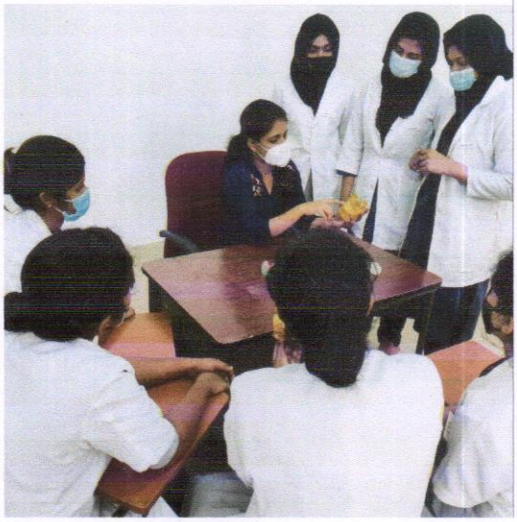
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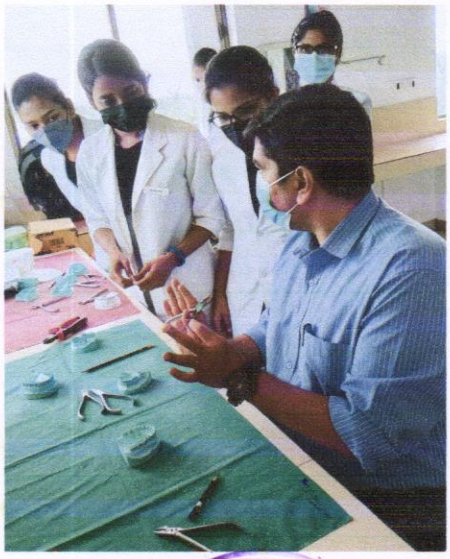
GROUP DISCUSION

Regular Group discussions are being conducted on clinical topics in all departments under supervision of professors \









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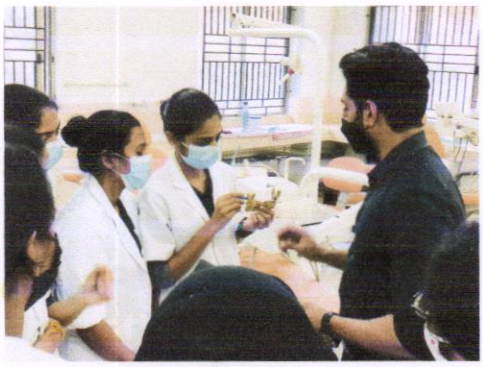
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MODEL PRESENTATIONS

The students of fourth year have prepared and presented the model on different topics. Whole class of students were present during the presentation. Respective batch in charges were present during presentation. After presentation 10 min were given for group discussion









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DEPT: OF ORTHODONTICS - BDS TIME TABLE

	8-9	9-10	10-10.15	10.15-11.15	11.15-12.15	12.15-1.15	1.15-2	2-3	3-4
MON	2nd Year Preclinical Reg				3rd Year clinics Reg			2nd Year Preclinical (R)	
		Part 1 (S) Theory DC Lecture hall 1			Part 1 clinics (R& S)			3rd year Clinics B,C & S Part 1 Clinics(R& S)	
TUE	2nd Year Preclinical (S)			3rd year theory DC Lecture hall 1				2nd Year Preclinical (S)	
					Part 1 clinics(R& S)			3rd Year clinics A,B Part 1 Clinics	
WED		Part 1 Theory DC Lecture hall 2			2nd year Preclinical			3rd year Clinics	
				Part 1 clinics(R& S)				Part 1 Clinics(R& S)	
THUR	2nd Year Preclinical			3rd Clinics year				3rd year Clinics A,C	
		Part 1 Theory DC Lecture hall 2		Part 1 Clinics(R& S)				Part 1 Clinics(R& S)	
FRI	2nd year Preclinical			3rd year Clinics Part 1 Clinics (R& S)				3rd year Clinics A,B Part 1 Clinics (R& S)	
SAT					2nd year Preclinical			3rd Year clinics	
				Part 1 Clinics(R& S)				Part 1 Clinics(R& S)	

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DEPT: OF PERIODONTICS - BDS TIME TABLE

	8-9	9-10	10-10.15	10.15-11.15	11.15-12.15	12.15-1.15	1.15-2	2-3	3-4
MON	3RD YEAR Theory DC Lecture hall 1			Part 1 clinics(R& S)	3rd Year clinics			3rd year Clinics B,C Part 1 Clinics(R& S)	
TUE		Part 1 Theory DC Lecture hall 2		Part 1 clinics(R& S)		3rd year Theory DC Lecture hall2		3rd Year clinics A,B Part 1 Clinics(R& S)	
WED				Part 1 clinics(R& S)				3rd year Clinics Part 1 Clinics(R& S)	
THUR				3rd Clinics year Part 1 Clinics(R& S)				3rd year Clinics A,C Part 1 Clinics(R& S)	
FRI	Part 1 Theory DC Lecture hall 2			3rd year Clinics Part 1 Clinics(R& S)				3rd year Clinics Part 1 Clinics (R& S)	
SAT				Part 1 Clinics(R& S)				3rd Year clinics Part 1 Clinics(R& S)	

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DEPT: OF ORAL MEDICINE & RADIOLOGY- BDS TIME TABLE

	8-9	9-10	10-10.15	10.15-11.15	11.15-12.15	12.15-1.15	1.15-2	2-3	3-4
MON		Part 1 Theory DC Lecture hall 2		Part 1 clinics(R& S)	3rd Year clinics			3rd year Clinics B,C Part 1 Clinics(R& S)	
TUE				Part 1 clinics(R& S)				3rd Year clinics A,B Part 1 Clinics(R& S)	
WED				Part 1 clinics(R& S)				3rd year Clinics Part 1 Clinics(R& S)	
THUR				3rd Clinics year Part 1 Clinics(R& S)				3rd year Clinics A,C Part 1 Clinics(R& S)	
FRI		Part 1 Theory DC Lecture hall 2		3rd year Clinics Part 1 Clinics(R& S)				3rd year Clinics Part 1 Clinics(R& S)	
SAT				3RD YEAR Theory DC Lecture hall 1 Part 1 Clinics(R& S)				3rd Year clinics Part 1 Clinics(R& S)	

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DEPT: OF PUBLIC HEALTH DENTISTRY - BDS TIME TABLE

	8-9	9-10	10-10.15	10.15-11.15	11.15-12.15	12.15-1.15	1.15-2	2-3	3-4
MON		3RD YEAR Theory DC Lecture hall 1		Part 1 clinics(R& S)	3rd Year clinics			3rd year Clinics B,C Part 1 Clinics(R& S)	
TUE	Part 1 Theory DC Lecture hall 2			Part 1 clinics(R& S)				3rd Year clinics A,B Part 1 Clinics(R& S)	
WED				Part 1 clinics(R& S)				3rd year Clinics Part 1 Clinics(R& S)	
THUR				3rd Clinics year Part 1 Clinics(R& S)				3rd year Clinics A,C Part 1 Clinics(R& S)	
FRI				3rd year Clinics Part 1 Clinics(R& S)				3rd year Clinics Part 1 Clinics(R& S)	
SAT	Part 1 Theory DC Lecture hall 2			Part 1 Clinics(R& S)				3rd Year clinics Part 1 Clinics(R& S)	

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DEPT: OF ORAL & MAXILLOFACIAL SURGERY - BDS TIME TABLE

Day	8 - 9	9 - 10		10.15 – 11.15	11.15 – 12.15	12.15 – 1.15		2 - 4
Mon	Part I Theory DC Lecture hall 2				III year Clinics Part I Clinics(R& S) Part II Clinics			III year Clinics B&C Part I Clinics(R& S) Part II Clinics
Tue	Part II Theory DC Lecture hall 3			Part I Clinics(R& S) Part II Clinics				III year Clinics A,B Part I Clinics(R& S) Part II Clinics
Wed	Part II Theory DC Lecture hall 3			Part I Clinics(R& S) Part II Clinics				III year Clinics Part I Clinics (R& S) Part II Clinics
Thu	Part II Theory DC Lecture hall 3			III year Clinics Part I Clinics(R& S) Part II Clinics				III year Clinics A,C Part I Clinics(R& S) Part II Clinics
Fri				III year Clinics Part I Clinics(R& S) Part II Clinics				III year Clinics Part I Clinics(R& S) Part II Clinics
Sat				Part I Clinics(R& S) Part II Clinics				3rd Year clinics Part I Clinics(R& S) Part II Clinics

BREAK

LUNCH

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DEPT: OF PEDODONTICS - BDS TIME TABLE

Day	8 - 9	9 - 10		10.15 – 11.15	11.15 – 12.15	12.15 – 1.15		2 - 4
Mon	Part II Theory DC Lecture hall 3				III year Clinics Part I Clinics(R& S) Part II Clinics			III year Clinics B,C Part I Clinics(R& S) Part II Clinics
Tue	Part II Theory DC Lecture hall 3			Part I Clinics(R& S) Part II Clinics				III year Clinics A,B Part I Clinics(R& S) Part II Clinics
Wed			B R E A K	Part I Clinics(R& S) Part II Clinics		III year Theory DC Lecture hall 1	L U N C H	III year Clinics Part I Clinics(R& S) Part II Clinics
Thu				III year Clinics Part I Clinics(R& S) Part II Clinics				III year Clinics A,C Part I Clinics(R& S) Part II Clinics
Fri	Part II Theory DC Lecture hall 3			III year Clinics Part I Clinics(R& S) Part II Clinics				III year Clinics Part I Clinics(R& S) Part II Clinics
Sat		Part ITheory DC Lecture hall 2		Part I Clinics(R& S) Part II Clinics				3rd Year clinics Part I Clinics(R& S) Part II Clinics

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	8-9	9-10	10-10.15	10.15-11.15	11.15-12.15	12.15-1.15	1.15-2	2-3	3-4
MON	1st Year Preclinical				2nd Year Preclinical			2nd Year Preclinical 3rd year Clinics B,C Part 1 Clinics(R& S) Part 2 clinics	
		Part 2 Theory DC Lecture hall 3			3rd Year clinics				
				Part 1 clinics(R& S) Part 2 clinics					
TUE	2nd Year Preclinical			Part 1 clinics(R& S) Part 2 clinics				2nd Year Preclinical 3rd Year clinics A,B Part 1 Clinics(R& S) Part 2 clinics	
WED	1st Year Preclinical 3rd Year Preclinical			2nd Year theory MC lecture hall 3	2nd year Preclinical			2nd Year Preclinical 3rd year Clinics Part 1 Clinics(R& S) Part 2 clinics	
	Part 1 Theory DC Lecture hall 2			Part 1 clinics(R& S) Part 2 clinics					
THU	1st year Theory MC lecture hall 5			2nd Year Theory DC Lecture hall 2	2nd year Preclinical			3rd year Clinics A,C Part 1 Clinics(R& S) Part 2 clinics	
	2nd Year Preclinical 3rd Year Preclinical			3rd Year clinics					
				Part 1 Clinics(R& S) Part 2 clinics					
FRI	2nd year Preclinical 3rd Year Preclinical			3rd year Clinics Part 1 clinics(R& S) Part 2 Clinics				3rd year Clinics Part 1 clinics(R& S) Part 2 Clinics	
		Part 2 Theory DC Lecture hall 3							
SAT	1st Year Preclinical				1st Year Preclinical			2nd year Preclinical 3rd Year clinics Part 1 Clinics Part 2 clinics	
	3rd Year Theory DC Lecture hall 1	Part 2 Theory DC Lecture hall 3		Part 1 Clinics(R& S) Part 2 clinics				Part 1 Clinics(R& S) Part 2 clinics	

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DEPT: OF COSERVATIVE DENTISTRY & ENDODONTICS - BDS TIME TABLE

	8-9	9-10	10-10.15	10.15-11.15	11.15-12.15	12.15-1.15	1.15-2	2-3	3-4
MON	2nd Year Preclinical			2nd Year Theory DC Lecture hall 2	2nd Year Preclinical 3rd Year clinics Part 1 clinics(R& S) Part 2 clinics			1st Year Preclinical 3rd year Clinics B,C Part 1 Clinics(R& S) Part 2 clinics	
TUE	2nd Year Preclinical	Part 2 Theory DC Lecture hall 3		2nd Year theory DC lecture hall 2	Part 1 clinics(R& S) Part 2 clinics			2nd Year Preclinical 3rd Year clinics A,B Part 1 Clinics(R& S) Part 2 clinics	
WED	1st Year Preclinical	Part 2 Theory DC Lecture hall 3		1st Year Preclinical 3rd Year Theory DC Lecture hall 2 Part 1 clinics(R& S) Part 2 clinics				2nd year Preclinical 3rd year Clinics Part 1 Clinics(R& S) Part 2 clinics	
THU	1st year Theory MC lecture hall 5 Part 1 Theory DC Lecture hall 2	Part 2 Theory DC Lecture hall 3		2nd year Preclinical 3rd Clinics year Part 1 Clinics(R& S) Part 2 clinics				1st Year Preclinical 3rd year Clinics A,C Part 1 Clinics(R& S) Part 2 clinics	
FRI				3rd year Clinics Part 1 Clinics(R& S) Part 2 clinics				3rd year Clinics Part 1 Clinics(R& S) Part 2 clinics	
SAT		3rd Year Theory DC Lecture hall 1		2nd Year Preclinical Part 1 Clinics(R& S) Part 2 clinics				2nd Year Preclinical 3rd Year clinics Part 1 Clinics(R& S) Part 2 clinics	

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DEPT: OF ORAL PATHOLOGY - BDS TIME TABLE

	8-9	9-10	10 -10.15	10.15-11.15	11.15-12.15	12.15-1.15	1.15-2	2-3	3-4
MON	1ST Year Practical			1st year Theory DC lecture hall 4				1ST Year Practical	
				3rd year Theory DC lecture hall 2					
TUE		3rd year Theory DC lecture hall 1							
WED	3rd Year Practical			1st year Theory DC lecture hall 1	1ST Year Practical				
				3rd year Theory DC lecture hall 2					
THU	3rd Year Practical							1ST Year Practical	
FRI	3rd Year Practical								
SAT	1ST Year Practical			1st year Theory DC lecture hall 2	1ST Year Practical				
	2nd Year theory MC lecture hall 2								

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DEPT: OF ANATOMY - BDS TIME TABLE

DAY	8-9	9-10	BREAK	10.15-11.15	11.15-12.15	12.15-1.15	LUNCH	2-4
MON								
TUE	Theory MC Lecture hall 1				PRACTICAL			Dissection
WED								Dissection
THU		Theory MC Lecture hall 1			PRACTICAL			
FRI		Theory MC Lecture hall 1		PRACTICAL				Dissection
SAT								

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DEPT: OF PHYSIOLOGY - BDS TIME TABLE

DAY	8-9	9-10	BREAK	10.15-11.15	11.15-12.15	12.15-1.15	LUNCH	2-3	3-4
MON						Theory MC Lecture hall 1			
TUE				Theory MC Lecture hall 1	PRACTICAL				
WED									
THU				Feb-June Theory MC Lecture hall 1	PRACTICAL				
FRI	Theory MC Lecture hall 1			PRACTICAL					
SAT								Theory MC Lecture hall 1	

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DEPT: OF BIOCHEMISTRY - BDS TIME TABLE

DAY	8-9	9-10	BREAK	10.15-11.15	11.15-12.15	12.15-1.15	LUNCH	2-3	3-4
MON					Theory MC Lecture hall 1				
TUE		Theory MC Lecture hall 1			PRACTICAL				
WED									
THU				Oct-JanTheory MC Lecture hall 1	PRACTICAL				
FRI				PRACTICAL					
SAT									Theory MC Lecture hall 1

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DEPT: OF PHARMACOLOGY- BDS TIME TABLE

DAY	8-9	9-10		10.15-11.15	11.15-12.15	12.15-1.15		2-4
MON				Supplementary Theory MC Lecture hall 3				
TUE					Regular Practical			
WED		Regular Theory MC Lecture hall 3						
THU						Supplementary Theory MC Lecture hall 3		
FRI			BREAK	Regular Theory MC Lecture hall 3				
SAT					Supplementary Practical			

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DEPT: OF PATHOLOGY- BDS TIME TABLE

DAY	8-9	9-10	10.15-11.15	11.15-12.15	12.15-1.15	
MON					Supplementary Theory	
TUE					Supplementary Theory	
WED						
THU			Supplementary Practical			Regular Practical - A
FRI			Supplementary Practical			Regular Practical -B
				Regular Theory		
SAT			Regular Theory			

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DEPT: OF MICROBIOLOGY- BDS TIME TABLE

DAY	8-9	9-10		10.15-11.15	11.15-12.15	12.15-1.15		2-4
MON								
TUE								
WED	Microbiology Theory MC Lecture hall 3							
THU								Microbiology Practical - B
FRI								Microbiology Practical –A
SAT		Microbiology Theory MC Lecture hall 3						

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DEPT: OF GENERAL MEDICINE - BDS TIME TABLE

DAY	8-9	9-10		10.15-11.15	11.15-12.15	12.15-1.15		2 -4
MON								
TUE								
WED	General Medicine – 1							
THU	General Medicine – 2							
FRI	General Medicine – 3							
SAT					General Medicine Theory			

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DEPT: OF GENERAL SURGERY- BDS TIME TABLE

DAY	8-9	9-10	BREAK	10.15-11.15	11.15-12.15	12.15-1.15	LUNCH	2 -4
MON								General Surgery Clinics - A
TUE						General Surgery Theory DC Lecture hall 1		General Surgery Clinics - C
WED								
THU						General Surgery Theory DC Lecture hall 1		General Surgery Clinics - B
FRI								
SAT								

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ACADEMIC YEAR 2017-18

ANALYTICAL SKILL DEVELOPMENT PROGRAM

ACTIVITY REPORT

Venue: UG clinic

No of participants: 75

\ SUMMARY:

Edentulous casts of patients were allotted to various groups consisting of 5 to 10 undergraduates posted in Department of Prosthodontics crown and bridge of our college. Students were asked to **design cast partial frame work on the cast**. This program gave the undergraduates a good opportunity in utilisation of their analytical skill for their future carrier.

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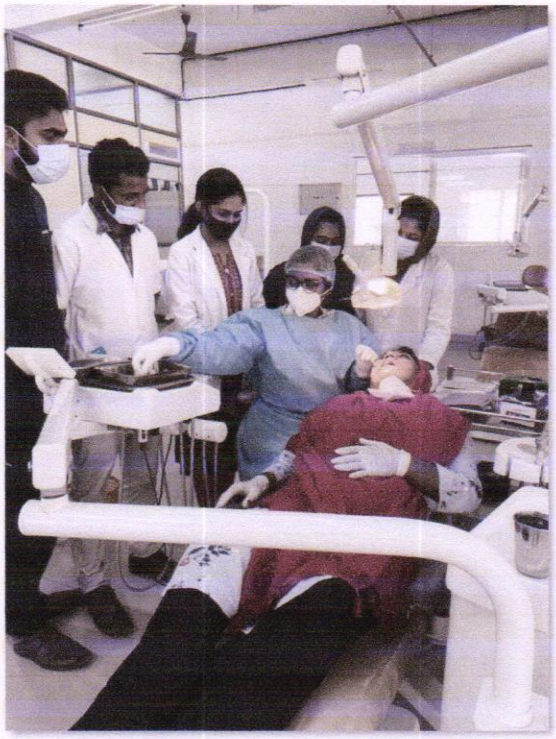




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