THE TAMIL NADU Dr. M.G.R. MEDICAL UNIVERSITY

No. 69, ANNA SALAI, GUINDY, CHENNAI – 600 032.

B.D.S.

DEGREE COURSES

SYLLABUS AND CURRICULUM

PRINCIPAL
SRI VENKATESWARA DENTAL COLLEGE & HOSPITAL
OFF. OMR NEAR - NAVALUR
THALAMBUR, CHENNAI-600 130.

THE TAMIL NADU Dr. M.G.R. MEDICAL UNIVERSITY, CHENNAI

PREFACE

The Syllabus and Curriculum for the B.D.S.Courses have been restructured with the Experts from the concerned specialities to educate students of BDS course to

1. Take up the responsibilities of dental surgeon of first contact and be capable of functioning independently in both urban and rural environment.
2. Provide educational experience that allows hands-on-experience both in hospital as well as in community setting.
3. Make maximum efforts to encourage integrated teaching and de-emphasize compartmentalisation of disciplines so as to achieve horizontal and vertical integration in different phases.
4. Offer educational experience that emphasizes health rather than only disease.
5. Teach common problems of health and disease and to the national programmes.
6. Use learner oriented methods, which would encourage clarity of expression, independence of judgement, scientific habits, problem solving abilities, self initiated and self-directed learning.
7. Use of active methods of learning such as group discussions, seminars, role play, field visits, demonstrations, peer interactions etc., which would enable students to develop personality, communication skills and other qualities towards patient care.

The Students passing out of this Prestigious University should be acquire 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 students 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.

(Subject to changes in Amendments in DCI Regulations and SAB Resolutions)

Prof. Dr.S.GEETHALAKSHMI, M.D., Ph.D.
VICE-CHANCELLOR

Comments / Feed back are welcome if any and mail it to registrar@tnmgrmu.ac.in

B.D.S. - DEGREE COURSE

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2. GENERAL HUMAN PHYSIOLOGY

1. **GOAL**

The broad goal of teaching Human Physiology to undergraduate Dental students is to provide 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.

2. **OBJECTIVES**

a. KNOWLEDGE AND UNDERSTANDING:

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

i. Explain the normal functioning of all the organ systems and their interactions for wellco-ordinated total body function.
ii. Assess the relative contribution of each organ system towards the maintenance of the milieu interior.
iii. 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 :

i. Conduct experiments designed for the study of physiological phenomena.
ii. Interpret experimental and investigative data
iii. Distinguish between' normal and abnormal data derived as a result of tests which he/she has performed and observed in the laboratory.

c. ATTITUDE:

To develop the attitude to serve the rural community.

d. INTEGRATION:

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

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e. KNOWLEDGE ABOUT INFECTION AND CROSS INFECTION IN DENTISTRY

Knowledge about asepsis – disinfection and sterilization of instruments, clinical area/ personal care as per universal protection, and disposal of medical wastes in the appropriate modes. Students should be aware of the rules and regulations pertaining to maintenance of clinical set up and waste disposal.

f. COMPUTER PROFICIENCY:

Basic knowledge of Computers, MS Office, Window 2000, Statistical Programmes Basic operative skills in analysis of data and knowledge of multimedia. Students should utilize a combination of traditional classroom courses, and online courses. The following validation is required and must be completed during the first year of study.

i). Technological Requirements for all Graduate Students

ii). A laptop or desktop computer that supports the following requirements

a). Operating system requirements
b). Internet browser requirements
c). Reliable and consistent access to the internet
d). Antrivirus software which is current and consistently updated
e). Microsoft Office
f). Adobe Reader (or equivalent to view PDF files)

3. **COMPETENCIES**

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
- Participate and involve in professional bodies
- Self-assessment & willingness to update the knowledge & skills from time to time
- Involvement in simple research projects
- Minimum computer proficiency to enhance knowledge and skills
- Refer patients for consultation and specialized treatment
- Basic study of forensic odontology and geriatric dental problems

ii. Practice Management :

- Evaluate practice location, population dynamics & reimbursement mechanism
- Co-ordinate & supervise the activities of allied dental health personnel
- Maintain all records
- Implement & monitor infection control and environmental safety programs
- Practice within the scope of one's competence

iii. Communication and Community Resources:

- Assess patients goals, values and concerns to establish rapport and guide patient care
- Able to communicate freely, orally and In writing with all concerned
- Participate in improving the oral health Of the individuals through community activities.

iv. 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

v. Patient Care - Treatment Planning:

- Integrate multiple disciplines into an individual comprehensive sequence treatment plan using diagnostic and prognostic information
- Ability to order appropriate investigations
- 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 anaesthesia
- Administration of intra muscular and venous injections
- Prescription of drags, 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 motivative procedures using different materials available
- Simple endodontic procedures
- Removable and fixed prosthodontics
- Various kinds of periodontal therapy

vi. Competencies specific to the subject

4. TEACHING HOURS

Lecture Hours – 120 hour

- General Physiology - 8 hours
- Blood - 16 hours
- Muscle and Nerve - 7 hours
- Gastrointestinal tract - 16 hours
- Excretion, Body temperature and functions of skin - 9 hours
- Endocrinology - 14 hours
- Reproduction - 7 hours
- Cardiovascular system - 10 hours
- Respiratory system - 10 hours
- Central Nervous system - 15 hours
- Special senses - 8 hours

Practical Hours – 60 hours

5. TEACHING METHODOLOGY

The objectives of teaching General human Physiology can be achieved by various teaching techniques such as:

a) Lectures
b) Lecture Demonstrations
c) Practical exercises

d) Audio visual aids
e) Seminar & Small group discussions with regular feed back from the students
f) Integrated Teaching
g) Symposium and continuing medical education programmes

6. THEORY SYLLABUS

TOPIC	MUST KNOW	DESIRABLE TO KNOW	NICE TO KNOW
Homeostasis and Feedback System	Describe the concept of maintenance of internal environment • Recognize that negative feedback is the most common type of physiological control	State and describe examples of negative feedback • State and describe instances of positive feedback in human physiology	
Cell Membrane	Describe with diagram the fluid mosaic model		
Membrane Transport	Classify transport mechanisms as Passive and active with examples and differentiate between them. • List and describe the following passive transport processes with examples: •Simple diffusion of respiratory gases through lipid film • Diffusion of ions through ion channels •Sodium, potassium, calcium and chloride channels •Non-gated channels, voltage gated, ligand-gated channels and mechano-gated channels • Facilitated diffusion – Glucose transporters (GluTs) • Osmosis • Describe the following active transport processes: • Primary active transport: • sodium-potassium pump, • Secondary active transport: sodium-glucose co-	Describe the differences between channel and carrier-mediated transport processes State Fick's law of diffusion • Describe the following active transport processes: • Primary active transport: • Proton pumps - V type H ATPase, H/K ATPase • Secondary active	

	transport (SGLT) and sodium-amino acid co-transport • Describe the following transport processes by formation of membrane vesicles Endocytosis• Exocytosis	transport: sodium hydrogen exchangers, sodium calcium exchangers, Na/2Cl/K symport	
Membrane Potential	Describe the mechanisms involved in genesis of resting membrane potential (RMP) in a prototype cell • Recognise the RMP in a nerve or cardiac cell • Nernst or equilibrium potential 'Equilibrium potential' • Action potentials in neuron, skeletal muscle cell, Sino atrial node and cardiac ventricular cell	• Patch Clamp Technique • Cathode Ray Oscilloscope	
Blood Introduction	• Describe the normal composition of blood • Describe the composition of plasma • State the difference between plasma and serum.		
Plasma Proteins (Integration with Biochemistry)	• State the site of production, normal range and describe the functions of Albumin • Discuss causes for decrease in serum Albumin levels with specific examples of disease conditions • Explain what is plasma on cotic pressure • Discuss the production, various types and role of Globulins (alpha, beta and gamma globulins)		
Erythrocyte Sedimentation Rate (ESR):	• Define and state normal values for ESR in men and women • Describe the factors influencing ESR (fibrinogen particularly) • Discuss the significance of ESR in disease states		
RBC	• Describe the physical characteristics of red blood cells • List causes and give explanation for physiological variations of the normal RBC count • Explain the functions of RBCs • List the changes in sites of erythropoiesis with age		

	• Illustrate the major changes that take place during the stages of erythropoiesis. • Describe the factors regulating/affecting erythropoiesis, • Discuss the normal life span and destruction of RBCs		
Hemoglobin	• State the components of Hb, the various types of Hb and normal range of Hb in men and women • Briefly discuss the synthesis of haemoglobin • what is reduced hemoglobin. • Define and describe cyanosis • Discuss the types of jaundice • Abnormal Hemoglobin		
Anaemia	• Define anaemia • Classify anaemia based on etiology and morphology • Discuss the principles of treating anemias • Describe major symptoms, signs and effects of anemia		
Platelet	• Describe the formation, structure, life span & removal of platelets • State the normal platelet count • Describe the functions of platelets. • Discuss the causes and effects of thrombocytopenia		
Hemostasis	• Describe the processes involved inhemostasis such as: • vasoconstriction • Platelet plug formation • Clotting or coagulation pathways • Clot retraction • Describe anticlotting and fibrinolytic mechanisms in the body • List anticoagulants and their mechanism of action • Explain various causes for abnormal hemostasis		

	• List the clotting factors and Explain the pathways of coagulation • Explain various causes for abnormal hemostasis • Perform and interpret simple tests of hemostasis like bleeding time by Duke's method and clotting time by capillary method of Wright on oneself by collecting blood using finger prick method using aseptic method • Explain Lee and White's method for determining clotting time		
Blood groups & Blood banking	• Describe the importance of blood groups • Explain the genetic determination of blood groups • Describe the ABO system of blood grouping • State the frequency of different blood groups • Describe the Rh system of blood grouping • Explain the mechanism and consequence of ABO and Rh incompatibility • Explain the condition Erythroblastosis Fetalis, state preventive measure and treatment option for the same.		
Body fluids	• List the different body fluid compartments, - state the volume, osmolarity and electrolyte composition of each of the following compartments • Total body water, extracellular, intracellular, plasma, intravascular • Describe the term transcellular fluid • Measurement of volumes of compartments • Describe the Starling's forces that govern fluid exchange across the membranes separating the various compartments • Define Donnan effect and equilibrium • Use the Concept of electro neutrality in the fluid compartments to calculate 'Anion gap'		

	• Define anion gap as the term referring to unmeasured anions in plasma.		
WBC	• State the normal Total and Differential count • Classify types of WBC as granulocytes, agranulocytes • Describe the morphology and functions of neutrophils, eosinophils, basophils, mast cells; Lymphocytes, monocytes. • Perform and interpret total leucocyte on their own blood / provided blood using aseptic precautions • List Conditions in which total leucocyte counts is increased or decreased. • List conditions in which counts of each type of WBC are increased or decreased • Describe the various cells that constitute the monocyte - macrophage system and state their function		
Leucopoiesis	• Outline the process of maturation of white blood cells		
Lymph	• Describe the formation and composition of lymph • Illustrate the lymphatic circulation. • Discuss functions of lymph.		
Reticulo endothelial system	Functions of reticulo endothelial system		
Skeletal Muscle Morphology	• Describe and draw the structure of sarcomere marking actin filament, myosin filament, I band, A band, H band, Z line and sarcomere • Describe the functions of contractile and regulatory proteins involved in muscle contraction • Draw and describe the structure of the sarco-tubular system		

Neuromuscular junction	• Draw and Describe the structure of the neuromuscular junction • Describe the events involved in neuromuscular transmission • Describe the pathophysiology of diseases affecting the neuromuscular junction like myasthenia gravis • Describe the mechanism of action cholinesterase inhibitors • Motor Unit		
Muscle Contraction	• Describe the molecular Basis of muscle contraction, events involved in excitation contraction coupling. • Explain the types of Muscle contraction • Describe the sliding filament theory of muscle contraction Role of ATP and calcium pumps in the mechanism of relaxation of the muscle • Describe the Factors affecting the force of contraction		
Smooth Muscle	• Structure, distribution, types, molecular mechanism of contraction		
Factors modulating smooth muscle contraction And Properties	• List the various factors that modulate smooth muscle contraction like stretch, sympathetic nerveous system, circulating substances etc. • Describe the special properties of smooth muscle like latch-bridge mechanism and plasticity		
Digestive System Introduction to GIT,			
Salivary Glands	Name the Salivary Glands composition • Functions of saliva.	Deficient salivation – Xerostomia	

	• Describe the regulation of salivary, secretion		
Stomach	Describe the composition and functions of gastric secretion • Describe the mechanism of gastric acid Secretion Discuss regulation of gastric secretion	proton pump inhibitor Pernicious anemia	
Exocrine Pancreas	Exocrine Pancreas- Describe the composition and functions of pancreatic secretion Explain the regulation of pancreatic secretion	Reason for the alkaline pH of pancreatic secretion and its importance	
Liver& Gall Bladder	Describe the composition and functions of Bile • Regulation of secretion	• Gall Stones • Jaundice	
Liver& Gall Bladder	Describe the composition and functions of Bile • Regulation of secretion		
Small Intestine	Discuss the secretions of small intestine and their functions& regulation of secretion	Malabsorption syndrome	
Large intestine	Explain the functions of large intestine and formation of faeces	dietary fibre • Constipation	
GI Motility	Mastication, deglutition, vomiting gastric filling and emptying, movements of small intestine ,large intestine, defaecation	State what is basic electrical rhythm of the gastrointestinal tract and it's role	
Excretory System Functional Anatomy of Kidney Structure of Nephron	Structure& functions of kidney and its functional Renal circulation • Describe the structure of the juxtaglomerular apparatus.		
Glomerular filtration	Glomerular filtration rate- definition, determination, factors influencing GFR	Concept of Renal Clearance	
Tubular reabsorption & secretion	Reabsorption of sodium, glucose ,water & other substances Secretion of urea, hydrogen and other substances	The concept of the transport maximum for glucose, renal	

		threshold	
Concentration of Urine	Countercurrent Mechanism • Countercurrent Multiplier • Countercurrent Exchanger • Role of Urea		
Regulation of Acid base balance	Blood buffers Role of Respiratory system and kidneys in maintaining acid base balance	Anion gap	
Micturition	Describe the innervation of Bladder and reflex pathway of micturition	cystometrogram	
Endocrinology Introduction to Endocrinology	• Define Hormone • Classify and list the hormones based on chemical nature • Mechanism of negative and positive feedback regulation of hormone release	• Describe the mechanism of action of hormones including the receptors and second messengers	
Hypothalamus	• Describe the relationship between hypothalamus and pituitary including the Hypothalamohypophyseal tract and the hypothalamohypophyseal portal circulation • List the various releasing and inhibiting hormones released by the hypothalamus		
Pituitary Gland	• List the various types of secretary cells of Anterior and Posterior Pituitary • List the Hormones secreted by the anterior and posterior pituitary. Growth hormone: • List the important actions of growth hormone, its effects on growth and metabolism • Describe the regulation of growth hormone secretion • List important stimuli that increases or decreases the secretion of GH • Prolactin: • Describe the actions and regulation of prolactin	• Describe the physiological basis and important features of abnormalities of growth hormone secretion like - Gigantism, acromegaly and pituitary dwarfism • Describe the mechanism of action of Growth hormone (JAK-STAT Pathway)	

	secretion • List the features of excess Prolactin secretion • Antidiuretic hormone (ADH) • Explain the synthesis, release and mechanism, functions and regulation of actions of ADH • Discuss the disorders of ADH secretion - Diabetes Insipidus • Oxytocin • Explain the synthesis, release mechanism, functions and regulation of Oxytocin List the functions of Oxytocin • Role in milk ejection reflex and parturition	• Explain how Insulin like growth factor (IGF) or Somatomedin mediates the actions of growth hormone • Types of Diabetes Insipidus •Panhypopituitarism • Shehan's Syndrome • Postpartum Pituitary Necrosis	
Thyroid Gland (Horizontal and Vertical Integration)	• Explain the functional Anatomy of Thyroid Gland • List the steps involved in the synthesis of thyroid hormones • Explain the mechanism of release of Thyroid Hormone • Explain the transport actions of thyroid hormone • Describe the regulation of thyroid hormone secretion • List the causes and features of Hypo secretion of thyroid hormones - Myxedema and Cretinism, Goitre and features of Hypothyroidism • List the causes and features Hypersecretion of thyroid hormones – Gigantism and Acromegaly • Calcitonin • Secretion and action of Calcitonin	• Explain the physiological basis for Simple Goitre • List the differences between dwarfism and cretinism	
Adrenal Gland	• List the hormones secreted by the different layers of Adrenal Cortex • Describe the Functional Anatomy of Adrenal Cortex • Describe the mechanism of action, functions and regulation of action of Mineralocorticoids,	• Disorders produced by the deficiency of enzymes involved in adrenocortical	

	Glucocorticoids and sex steroids • Discuss the causes and features of Cushing's Syndrome and Addison's Disease • Adrenal medulla: • Synthesis and physiological effects of epinephrine and nor-epinephrine on various systems of the body • Factors that regulate the secretion of adrenal medullary hormones	hormone synthesis • Diseases related to Mineral ococorticoids • Conn's Syndrome • Aldosterone Escape • Atrial Natriuretric Peptide (ANP)	
Endocrine Pancreas	• Name the different cells present in the Islets of Langerhans • Physiological stimulus for Insulin secretion • List the target cells of Insulin and the cells that do not require insulin action for glucose uptake • Mention the mechanism of action of Insulin on its receptor • List the important actions of insulin • List the various factors that regulate insulin secretion • Describe the features of hyper secretion of Insulin and Hypoglycemia • Glucagon • List the important actions of glucagon	• Describe the steps in biosynthesis of Insulin and the origin of the C- peptide (Connecting peptide) • Diabetes Mellitus: • Discuss the Pathophysiology of Diabetes mellitus • List the hormones that raise blood sugar level	
Reproductive System Sex Determination	• Differentiate between Genetic sex, Gonadal sex and phenotypic sex. • Describe the role of SRY gene and testis determining factor in development of gonads • Describe the role of testosterone and Mullerian inhibiting substance in the development of male and female internal genitalia	• Discuss the role of dihydrotestosterone in the development of external genitalia	
Male	• Describe the functional anatomy of the male	• Outline the steps	

Reproductive Physiology	reproductive tract (Testis seminiferous tubules, Sertoli cells, Leydig cells, Blood Testis barrier, Epididymis, Vas deferens, Seminal vesicle, Prostate gland). • Describe the blood- testis barrier and its function • Discuss factors that regulate Spermatogenesis • Describe the structure of spermatozoa • Describe the source, mechanism of action and functions of testosterone and dihydrotestosterone • State the source and functions of inhibin Discuss the hypothalamic and pituitary control on testicular function and Feed back control of testicular hormones on hypothalamus and pituitary • Describe the role of prostate, seminal vesicles in reproductive function • Describe the mechanisms that cause erection and ejaculation • State what is capacitation and discuss the changes that occur during capacitation	involved in spermatogenesis • State the composition of semen and recognize use of semen analysis as a test to evaluate infertility • Discuss about abnormalities of the male reproductive system: • Hypogonadism • Cryptorchidism	
Puberty Menopause Pituitary Gonadotropins (FSH,LH) and Prolactin	• Describe the mechanism of action functions and regulation of secretion of pituitary gonadotropins and prolactin • Explain the changes that occur during puberty and describe the mechanism of onset of puberty • Define menopause and describe the physiological changes during menopause	• Discuss causes of precocious and delayed puberty	
Female reproductive system	• Describe the Functional anatomy of the female reproductive system • Outline the stages of Oogenesis • State differences between oogenesis and spermatogenesis • Describe the development of ovarian follicles (Stages of follicle development, ovulation,	• Differences between oogenesis and spermatogenesis • Discuss the physiological basis of use of synthetic estrogens	

	luteinisation, luteal regression) • Describe the control of follicular development, ovulation and luteinisation (role of FSH, estrogen and LH) • Describe the process of follicle attrition • List the hormones produced by the ovary • Illustrate the synergistic role of thecal and granulosa cells in steroidogenesis • Discuss the mechanism of action and functions of estrogen and progesterone • Describe the feedback regulation of ovarian function • Describe the physiological changes occurring in ovaries, uterus, cervix , vagina and breast during a menstrual cycle • Discuss and illustrate the hormonal changes during the menstrual cycle (changes in FSH, LH, estrogen and progesterone)	and progestins as oral contraceptives • Describe the mechanism of ovulation • State the tests for ovulation and their physiological basis • Common causes of anovulatory cycles (physiological, PCOD) • Protein hormones produced by the ovary and state their source and functions • Identify common causes of anovulatory cycles (physiological, PCOD)	
Physiology of Pregnancy	• Outline the process of fertilization, implantation and placental formation • Discuss the importance of corpus luteum of pregnancy • Discuss the functions of placenta. • Discuss the secretion and function of hCG from the placenta. • Describe the role of hormonal and mechanical factors influencing labor • Describe the changes that occur in the various organ systems in the mother during pregnancy	• Physiological basis of immunological tests for pregnancy based on hCG • Parturition • Source and functions of relaxin • Describe the fetoplacental unit	

Lactation	• Describe the Role of estrogen and progesterone in breast development • Describe the mechanism that causes initiation of lactation after delivery • Describe the role of Prolactin and prolactin inhibitory factor (Dopamine) in lactation • Describe the Milk ejection reflex	• Role prolactin inhibitory factor (Dopamine) in lactation • Discuss the effect of lactation on menstrual cycle	
Contraception	• Classify male & female contraceptive methods- (temporary and permanent) • Describe the physiological basis of the various methods of contraception	• Details of contraceptives devices, side effects	
Cardiovascular System Introduction to CVS	Functional anatomy and innervation of heart		
Conducting system of Heart SA Node	.Origin and propagation of cardiac impulse ventricular cell action potential (fast AP). • Describe how the action potential leads to an increase in cytosolic calcium concentration • Describe excitation-contraction coupling • State the basic concepts of the sliding filament theory of contraction	•Intrinsic rate of the SA node and influence of autonomic nervous system,hormones and temperature. • Sinus arrhythmia, sinus bradycardia, sinus tachycardia • Record respiration with a stethograph or respiration belt transducer, as well as ECG or pulse simultaneously, to demonstrate respiratory sinus arrhythmia. calcium	

		exchanger (NCX)	
Cells of conducting pathway	• State the type of: • AV node AP - similar to SA nodal cell (slow AP) • His Bundle cell: fast AP • Purkinje fibres: fast AP		
Properties of Cardiac Muscle	• Automaticity • Excitability • Conductivity • Contractility		
Cardiac Cycle	• Describe with a diagram, the chronological relationship of the following events shown on the same time axis: • ECG • Valvular events • Heart sounds • Pressure curves: Left ventricular pressure, Atrial pressure and aortic pressure • Ventricular Volume curve: volume changes in ventricles, JVP Arterial pulse potential.	• Concept of Murmurs • Timing of Murmurs • State the timing of murmurs in various valvular and congenital heart defects • Cardiac Catheterization	
ECG	• Describe the 12 Leads in which ECG is recorded. • State the rationale of recording from multiple leads. • Identify the lead which is commonly used to monitor patients continuously. • Describe the P, QRS, T and U waves of an ECG in lead II configuration and describe the electrical events responsible for these waves • Describe PR and QT intervals and state what they represent • Describe the significance of ST segment being on the isoelectric line in a normal ECG • Record an ECG in a human subject in all 12 leads • Calculate rate from a normal ECG tracing	• Hyperkalemia • Ventricular tachycardia • State the causes for PR prolongation • Describe the types of Heart block as represented by ECG changes • Arrhythmias • Vector cardiogram • Calculation of axis	

	• Identify if every QRS complex is preceded by a P wave and if every P wave is followed by a QRS complex • State in what conditions the above will not happen	• His bundle electrogram	
Cardiac Output	• Definition of Stroke Volume, Cardiac Index, EDV, ESV, and EF • Discuss the determinants of cardiac output • Describe the regulation of cardiac output • Discuss high output and low output states	• Methods of Measuring Cardiac Output	
Heart Rate	• Innervation of Heart – Parasympathetic and Sympathetic • Normal Values • Regulation of Heart Rate • Factors affecting Heart Rate	Tachycardia Bradycardia Arrythmias	
Blood Pressure	• Define the following terms: • Mean arterial blood pressure, Systolic pressure, Diastolic pressure, pulse pressure • Describe the determinants of blood pressure • Discuss the short-term (neural and hormonal) and long term (renal) mechanisms regulating blood pressure (with special reference to shock and exercise). • Demonstrate the method of measurement of blood pressure using a sphygmomanometer. • Describe the principle of measuring blood pressure by sphygmomanometry • Discuss other methods of measuring blood pressure by sphygmomanometer hypertension Cardiovascular changes during exercise and postural changes	• Hypertension • Hypotension hypertension	
Cardiovascular homeostasis	• Features and regulation of the following circulations: • Coronary Changes in blood flow during different phases of cardiac cycle		

Coronary circulation	• Features and regulation of the following circulations: • Coronary Changes in blood flow during different phases of cardiac cycle Methods for measuring coronary blood flow sympathetic regulation versus local metabolic factors in the regulation of the regional circulations mentioned above.	Angina pectoris Myocardial infarction	
Hypertension	• State the normal ranges for systolic and diastolic blood pressures in the various age groups • Define hypertension	• Discuss the risk factors for essential hypertension and causes of secondary hypertension	
Respiratory System Functional Anatomy	• Functional Anatomy of the respiratory tract • Functions of nose and para-nasal sinuses • Conducting zone and respiratory zone • Pulmonary vasculature • Structure of alveolus & alveolo capillary membrane	Examination of RS	
Muscles of Respiration	• Muscles of Inspiration and Expiration • Accessory Muscles of respiration		
Surface Tension Surfactant	• Surface Tension in air liquid interface • Law of Laplace • Role of surfactant	• Respiratory Distress Syndrome	
Mechanics of respiration Pulmonary Ventilation	• State the normal respiratory rate and define inspiration & expiration • List the muscles of inspiration, expiration & accessory muscles of respiration • Describe the movements of chest wall and the changes in chest wall dimensions produced by respiratory muscles • Recognise the difference between quiet breathing and forceful breathing • Discuss the factors affecting airflow between the atmosphere and alveoli		

	• State the recoil nature of Lungs and chest wall • State the values of intra alveolar pressure, Intra pleural pressure • Discuss the changes in alveolar and intra pleural pressures during respiration • Identify the sites of air way resistance • Indicate changes in airway resistance with inspiration and expiration • Explain the action of autonomic nervous system on bronchial tone • List histamine as a bronchoconstrictor • Recognise that airway resistance is increased in obstructive lung diseases • Define lung compliance and relate it to clinical conditions in which it is altered • State clinical conditions in which work of breathing is increased		
Lung Volumes and Capacities	• Define the lung volumes and capacities; state the normal values and discuss their physiological variations • Explain the recording of the Spirogram with a diagram and recognize the volumes and capacities which cannot be measured by spirometry • Record the lung volumes and capacities of a normal subject using a spirometer • Discuss the physiological significance of the Residual volume & functional residual capacity • Describe the forced expiratory spirogram and describe FEV1, FVC and the FEV1/FVC ratio and its variations in obstructive and restrictive lung diseases. • Define peak expiratory flow & state its normal value • Record peak expiratory flow in abnormal subject	• List the common causes Pathology & clinical features of obstructive and restrictive lung diseases. • Asthma • COPD • Emphysema • Chronic bronchitis • State the physiological basis of tests to differentiate them. • Recognize the flow-volume curves • Methods of	

	• Record FEV1, FVC and calculate the FEV1/FVC ratio in a normal subject • Interpret altered values of absolute lung volumes, peak expiratory flow and FEV1/FVC ratio in restrictive and obstructive lung diseases • Define minute ventilation, anatomical dead space, physiological dead space & alveolar ventilation • Discuss the effect of changes in respiratory rate and tidal volume on alveolar ventilation	determining FRC and RV Helium dilution method • Whole body plethysmography • Measurement of dead space	
Alveolar Ventilation	• Total ventilation = Tidal Volume x Respiratory Rate • Dead Space and Classification • Alveolar Ventilation • Factors affecting alveolar ventilation	Measurement of Dead Space	
Gas Exchange	• Discuss the factors that affect rate of gas exchange at lung & tissue level, with application to clinical conditions State Fick's law of diffusion • Discuss normal composition of atmospheric, tracheal and alveolar air and recognize the conditions which can affect it • Discuss the normal partial pressures of gases in blood entering and leaving lung • Explain oxygen uptake and carbon dioxide elimination by lungs & tissues and state the normal rates of the same • Define respiratory exchange ratio and state its normal values • State normal time taken for gas equilibration & its application in exercise • State the physiological causes for normal alveolar-arterial oxygen difference • Explain the dependence of carbon dioxide elimination on ventilation • Define physiological shunt	• Define Type I respiratory failure and state the common causes • Explain Type I respiratory failure due to unequal V/Q distribution even when total ventilation and perfusion may be normal • State the Alveolar gas equation and discuss its application • Recognize that arterial PCO2 is equal to alveolar PCO2 and that arterial PCO2 can be used in the alveolar gas equation	

		• State the causes for abnormal Alveolar – arterial oxygen difference • Distinguish between intrapulmonary and extrapulmonary right to left shunts.	
Transport of Oxygen	• Explain the forms of oxygen transport in blood • Discuss hemoglobin affinity for oxygen • Explain & illustrate oxygen hemoglobin dissociation curve and discuss the factors affecting it and the physiological advantages of the curve • Explain Bohr effect • Discuss oxygen carrying capacity of blood • Differentiate between oxygen content of blood & % oxygen saturation of hemoglobin • Define hypoxemia and hypoxia; explain the physiological basis of types of hypoxia with examples • Define cyanosis and differentiate between conditions in which it occurs and may not occur	State the physiological basis of oxygen therapy as treatment for the different types of hypoxias	
Transport of Carbon dioxide	• Explain the forms of carbon dioxide transport in blood • Explain the role of chloride shift and Haldane effect		
Regulation of Respiration	• Express the concept of the sensors, central controller in brain & effectors in the respiratory control system • Describe the location and functions of the respiratory centres in brain; describe the current explanation for the basic rhythm of respiration • Describe the effects of neural inputs on respiration in terms of the voluntary cortical control, motor	• State the normal values of arterial blood gases (ABG) and interpret altered values • Define hypercapnoea and hypocapnoea	

	cortical input, limbic input, peripheral afferent inputs (Heringbreuer reflexes, J receptor input, proprioceptor input, and other peripheral inputs) • Express the aim of chemical control of respiration; explain the role of peripheral and central chemoreceptors; explain the feedback control of ventilation to regulate gas exchange & maintain normal levels of arterial blood gases and pH • Discuss and compare the influence of arterial carbon dioxide and oxygen on ventilation in health and in disease • Describe Cheyne-stokes breathing, state its causes, explain the physiological and pathophysiological mechanisms that produce it; state the abnormality in Biot's breathing • Demonstrate the effect of apnoea & hyperventilation on respiration; demonstrate the effect of breathing through a tube and the effect of speech & cough on respiration	• State the causes of asphysxia	
Pulmonary Function Tests	• Spirometry • Arterial Blood Gas Analysis • Peak Flow Meter • Pulseoxymetry		
Central Nervous System Organization of the nervous system	CNS PNS Somatic NS Autonomic NS Enteric NS		
Neuronal organization at spinal cord level	Neural Tissue Nerve Fibres Electrical properties of the nerve cell membrane	Numerical classification of sensory fibres • Mechanism of axoplasmic transport	

		•Wallerian degeneration Neurotransmitters	
Synapse, receptors, reflexes, sensations and tracts	Define the structure properties of synapse: classification of reflexes ascending and descending tracts, Types of sensations	Pathway for proprioception	
Physiology of pain	Pathway for transmission of pain, fast pain & slow pain, referred pain	Endogenous Analgesic system and gate control theory	
Cerebellum Thalamus Hypothalamus, Cerebral cortex	Structure,functions,connections and applied aspects of cerebellum, thalamus, hypothalamus, cerebral cortex	cerebellar lesions cerebellar function tests, thalamic syndrome, corpus callosum	
CSF	• Describe the composition, Secretion, Circulation, Drainage and Functions	• Papilledema • Hydrocephalus	
Autonomic nervous system	Organization of sympathetic and parasympathetic nervous system.		
Special Senses Vision, Hearing, Taste and Smell	Fundamental knowledge of Vision, Hearing, Taste and Smell		

Bioethics

Bioethics is the application of ethics to the field of medicine and healthcare. Bioethics includes medical ethics, which focuses on issues in health care; research ethics, which focuses issues in the conduct of research; environmental ethics, which focuses on issues pertaining to the relationship between human activities and the environment, and public health ethics.

7. **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
a. Enumeration of Red Blood Cells
b. Enumeration of White Blood Cells
c. Differential leucocyte counts
d. Determination of Haemoglobin
e. Determination of blood group
f. Determination of, bleeding time and clotting time
g. Examination of pulse
h. Recording of blood pressure.

DEMONSTRATION:
a. Determination of packed cell volume and erythrocyte sedimentation rate
b. Determination of specific gravity of blood
c. Determination of erythrocyte fragility
d. Determination of vital capacity and timed vital capacity
e. 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.
f. Electrocardiography: Demonstration of recording of normal Electro cardiogram
g. Clinical examination of cardiovascular and respiratory system.

8**. THEORY EXAMINATION**

Essay	1 ×10 = 10 marks
Short Essay	3 × 5 = 15 marks
Short Answers	5 × 2 = 10 marks
	Total = 35 marks

9. **PRACTICAL /CLINICAL EXAMINATION**

PRACTICAL EXAMINATION

MAJOR- 20 MARKS

Enumeration of Red Blood Cells.
Enumeration of White Blood Cells.
Differential leucocyte counts.
Recording of blood pressure.

MINOR- 15 MARKS

Determination of Haemoglobin.
Determination of blood group.
Determination of, bleeding time and clotting time.

OSPE - 4 MARKS

Recording Blood Pressure by Palpatory Method
Examining Radial Pulse

CHART - 6 MARKS
TOTAL – 45 MARKS

VIVA - 10 MARKS

	Examination	Internal Assessment	Viva	Total
Theory	35	5	10	50
Practicals	45	5	-	50
Total				100

10. **FORMATIVE / INTERNAL ASSESSMENT**

The continuing assessment examination (both Theory/Practical) held at least 3times in a particular year and best of two examinations shall be considered. The Internal Assessment marks to be submitted to the university, once in every three

months. The marks scored by the students shall be displayed on the Notice board and a copy forwarded by HOD shall be sent to the University once in every 3 months.

Theory – 5 marks
Practical – 5 marks
Total - 10marks

Topics for each Assessment
a. General Physiology, Blood, Nerve and Muscle Physiology.
b. Gastro intestinal Tract.
c. Cardiovascular System.
d. Respiratory System.
e. Excretory System, Endocrinology and Reproductive System.
f. Central Nervous System And Special Senses.

11. **RECORD NOTE / LOG BOOK**

Record shall be maintained and assessed periodically by faculty and HOD. Institution shall provide adequate number of cases/teaching materials as specified in Dental Council of India regulation for the students during clinical/practical training and examinations.

12. **TEXT BOOKS**

i) A .K. Jain ;Human Physiology for BDS students
ii) Chauduari ;Concise Medical Physiology

13. **REFERENCE BOOKS**

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

BIOCHEMISTRY

1. GOAL

The broad goal of the teaching of undergraduate students in biochemistry is to make them understand the scientific basis of the life processes at the molecular level and to orient them towards the application of the knowledge acquired in solving dental oriented clinical problems.

2. OBJECTIVES

KNOWLEDGE AND UNDERSTANDING

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

i. describe the molecular and functional organization of a cell and list its subcellular components;
ii. delineate structure, function and inter-relationships of biomolecules and consequences of deviation from normal;
iii. summarize the fundamental aspects of enzymology and clinical application wherein regulation of enzymatic activity is altered;
iv. describe digestion and assimilation of nutrients and consequences of malnutrition;
v. integrate the various aspects of metabolism and their regulatory pathways;
vi. explain the biochemical basis of inherited disorders with their associated sequelae;
vii. describe mechanisms involved in maintenance of body fluid and pH homeostasis;
viii. outline the molecular mechanisms of gene expression and regulation, the principles of genetic engineering and their application in dentistry
ix. summarize the molecular concepts of body defence and their application in dentistry
x. outline the biochemical basis of environmental health hazards, biochemical basis of cancer and carcinogenesis
xi. explain the principles of various conventional and specialized laboratory investigations and instrumentation analysis and interpretation of a given data relevant to dentistry
xii. suggest experiments to support theoretical concepts and clinical diagnosis.

SKILLS:

At the end of the course, the student should be able to : (1) make use of conventional techniques/instruments to perform biochemical analysis relevant to clinical screening and diagnosis; (2) analyze and interpret investigative data; (3) demonstrate the skills of solving scientific and clinical problems and decision making in dentistry.

ATTITUDE:

At the end of the course, the student should be able to understand the biochemical basis of the health and diseases.

INTEGRATION:

The knowledge acquired in biochemistry should help the students to integrate molecular events with structure and function of the human body

KNOWLEDGE ABOUT INFECTION AND CROSS INFECTION IN DENTISTRY

Knowledge about asepsis – disinfection and sterilization of instruments, clinical area/ personal care as per universal protection, and disposal of medical wastes in the appropriate modes. Students should be aware of the rules and regulations pertaining to maintenance of clinical set up and waste disposal.

COMPUTER PROFICIENCY

Basic knowledge of Computers, MS Office, Window 2000, Statistical Programmes. Basic operative skills in analysis of data and knowledge of multimedia. Students should utilize a combination of traditional classroom courses, and online courses. The following validation is required and must be completed.

i. Technological Requirements for all Graduate Students
ii. A laptop or desktop computer that supports the following requirements
   a. Operating system requirements
   b. Internet browser requirements
   c. Reliable and consistent access to the internet
   d. Antivirus software which is current and consistently updated
   e. Microsoft Office
   f. Adobe Reader (or equivalent to view PDF files)

3. **COMPETENCIES**

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
- Participate and involve in professional bodies
- Self-assessment & willingness to update the knowledge & skills from time to time
- Involvement in simple research projects
- Minimum computer proficiency to enhance knowledge and skills
- Refer patients for consultation and specialized treatment
- Basic study of forensic odontology and geriatric dental problems

ii. Practice Management :

- Evaluate practice location, population dynamics & reimbursement mechanism
- Co-ordinate & supervise the activities of allied dental health personnel
- Maintain all records
- Implement & monitor infection control and environmental safety programs
- Practice within the scope of one's competence

iii. Communication and Community Resources:

- Assess patients goals, values and concerns to establish rapport and guide patient care
- Able to communicate freely, orally and In writing with all concerned
- Participate in improving the oral health Of the individuals through community activities.

iv. 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

v. Patient Care - Treatment Planning:

- Integrate multiple disciplines into an individual comprehensive sequence treatment plan using diagnostic and prognostic information
- Ability to order appropriate investigations

- 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 anaesthesia
- Administration of intra muscular and venous injections
- Prescription of drags, 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 motivative procedures using different materials available
- Simple endodontic procedures
- Removable and fixed prosthodontics
- Various kinds of periodontal therapy

To sensitize the students on the ethical issues in the form of Lectures.

- Introduction to ethics.
- Ethics of the individual.
- Profession ethics.

Research ethics

vi. Competencies Specific to the subject

4. **TEACHING HOURS**

Theory classes: Total: 70 hours.

S. no	Topic	Number of hours
1	Cell	1
2	Chemistry of carbohydrates	3

3	Chemistry of lipids	2
4	Chemistry of proteins	3
5	Chemistry of nucleic acids	2
6	Vitamins	8
7	Minerals	5
8	Nutrition	2
9	Enzymes	3
10	Bioenergetics	2
11	Carbohydrate metabolism	7
12	Lipid metabolism	5
13	Protein metabolism	6
14	Integration of metabolism	1
15	Hemoglobin, Immunoglobulins & plasma proteins	5
16	Nucleotide metabolism & medical genetics	5
17	Homeostatic mechanisms in the body (pH, acid base, water and electrolyte balance)	3
18	Hormones	1
19	Muscle ,Bone and connective tissue	2
20	Metabolism of xenobiotics & oxygen toxicity	1
21	Function tests	2
22	Importance of ethical issues in laboratory medicine	1

5. TEACHING METHODOLOGY

Lectures, tutorials, seminars, small group discussions, integrated teaching modules, use of charts (paper-based clinical scenarios) for case discussions, practical exercises and demonstrations.

6. THEORY SYLLABUS

TOPIC	MUST KNOW	DESIRABLE TO KNOW	NICE TO KNOW
Chemistry of Bio-Organic Molecules	Cell: structure & function of cellular components Structure of membranes and transport.		

	Exocytosis and endocytosis Chemistry of Carbohydrates: Definition, biological importance and classification. Monosaccharides - Isomerism, anomerism. Sugar derivatives, Disaccharides. Polysaccharides. Components of starch and glycogen. Chemistry of Lipids : Definition, biological importance and classification. Fats and fatty acids. Introduction to compound lipids. Hydrophobic and hydrophilic groups. Cholesterol. Bile salts. Micelle. Chemistry of Proteins: Biological importance. Classification and properties of amino acids & proteins. Peptides. Introduction to protein structure. Denaturation. Fibrous protein: Collagen and elastin. Glycosaminoglycans. Classification, separation & functions of Plasma proteins Chemistry of Nucleic acids: Biological importance of nucleic acids.Outline structure of DNA and RNA.	Glycosaminoglycans	
Macro Nutrients and Digestion	Digestion and absorption of carbohydrates, proteins & lipids		
Micro Nutrients	Vitamins :Definition, classification, daily requirement, sources,biochemical functions and deficiency symptoms of Vitamin A, Vitamin D, Vitamin E, Vitamin K, Vitamin B and Vitamin C.	Introduction to antivitamins and hypervitaminosis.	

	Minerals: Classification, sources, absorption, functions and daily requirement of Calcium, phosphorus, Iron, Iodine and Fluoride. Nutrition: Energy needs: Basal metabolic rate. Dietary fibres. Nitrogen balance. Essential amino acids. Protein calorie malnutrition .	Iodine: source, absorption & functions. Other trace elements. Balanced diet.	
Energy Metabolism	Electron Transport Chain And Oxidative Phosphyorylation Components of respiratory chain Oxidative Phophorylation & mechanism of ATP generation, Inhibitors & uncouplers of ETC, & Clinical aspects Carbohydrate Metabolism: Glycolysis, pyruvate oxidation, citric acid cycle and Gluconeogenesis. Lactate metabolism . Introduction to glycogenesis, glycogenolysis.Importance of pentose phosphate pathway. Formation of glucuronic acid. Regulation of blood glucose. Diabetes mellitus and related disorders. Evaluation of glycemic status. Lipid Metabolism: Beta oxidation of fatty acids, Ketone body formation and utilisation, Outlines of cholesterol synthesis and breakdown. Protein Metabolism: Ammonia metabolism. Urea formation.	Glycogen storage disorders, glucose 6-phosphate dehydrogenase deficiency fatty acid synthesis, lipogenesis and lipolysis.	
Special aspects of Metabolism	Importance of pentose phosphate pathway. Formation of glucuronic acid. Phosphocreatine formation.Transmethylation.	Biogenic Amines. Introduction to other functions of amino	

		acids including one carbon transfer. Detoxication: Typical reactions. Examples of toxic compounds. Oxygen Toxicity.	
Biochemical Genetics and Protein Synthesis	Structure and functions of DNA & RNA.	Antimetabolites and antibiotics interfering in replication, transcription and translation. Introduction to cancer, viruses and oncogen.	
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. Serum enzymes in diagnosis Hormones:Brief introduction to thyroid hormones.	Introduction to second messengers, cyclic AMP, calcium ion, inositol triphosphate. Hyperthyroidism and hypothyroidism: Biochemical	Mechanism of action of steroid hormones, epinephrine, glucagon and insulin in brief.

	Acid base regulation & electrolyte balance: Normal pH of blood and its regulation.	evaluation. Approaches to treatment.	
Structural Components and Blood Proteins	Connective tissue: Collagen and elastin, Bone structure, Introduction to cytoskeleton. Haemoglobin & Immunoglobulins: Structure & functions of Heme & Immunoglobulins.Heme degradation. Other plasma proteins	Introduction to heme synthesis.	Myofibril and muscle contraction. Plasma lipoproteins.
Medical Biochemistry	a) Regulation of blood glucose,Diabetes mellitus & related disorders,Evaluation of glycemic index. b) Hyperthyroidism and hypothyroidism: Biochemical evaluation. Approaches to treatment. c) Hyperlipoproteinemias and atherosclerosis. d) Jaundice: Classification and evaluation. Liver function tests: Plasma protein pattern, serum enzymes levels. e) Kidney function tests & gastric function tests. f) Disorders of Acid base balance & Electrolyte balance. Ethics: - To sensitise the students on the ethical issues in the form of Lectures. -Introduction to ethics.		

	-Ethics of the individual. -Profession ethics. -Research ethics.		

Bioethics

Bioethics is the application of ethics to the field of medicine and healthcare. Bioethics includes medical ethics, which focuses on issues in health care; research ethics, which focuses issues in the conduct of research; environmental ethics, which focuses on issues pertaining to the relationship between human activities and the environment, and public health ethics

7. **PRACTICALS:** Hours

1. Qualitative analysis of carbohydrates-
   Identification of reducing & non reducing sugar 8
2. Colour reactions of proteins and amino acids 8
3. Normal constituents of urine-Demonstration-i) organic constituents 4
   ii) inorganic constituents 4
4. Abnormal constituents of urine 11
5. Analysis of saliva including amylase by qualitative methods 4
6. Blood glucose estimation – GOD/POD method 4
7. Serum total protein estimation - Biuret method 4
8. Urine creatinine estimation Demonstration 2

CHARTS – Discussion of clinical case scenarios

1. Paper electrophoresis charts/clinical data evaluation 2
2. Glucose tolerance test profiles 4
3. Serum lipid profiles 1
4. Profiles of hypothyrodisim and hyperthyrodisim 2
5. Acid base disorder 2

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60 hours

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8. **THEORY EXAMINATION**

Essay	1 ×10 marks =	10 marks
Short Notes	3 × 5 marks =	15 marks
Short answers	5 x 2 marks =	10 marks
	Total =	35 marks

9. **PRACTICAL /CLINICAL EXAMINATION**

- Quantitative estimation - 20 Marks
  Quantitative estimation of analyst- Glucose
  Protein
- Qualitative analysis of abnormal constituents in urine- 15 marks
- Chart 6 marks
  2 Charts 3 marks each.
- OSPE - 4 marks
  2 Performance stations 2 marks each.

Total – 45 Marks

Viva -10Marks

	Examination	Internal Assessment	Viva	Total
Theory	35	5	10	50
Practicals	45	5	-	50
Total				100

10. **FORMATIVE / INTERNAL ASSESSMENT**

The continuing assessment examination (both Theory/Practical) held at least 3times in a particular year and best of two examinations shall be considered. The Internal Assessment marks to be submitted to the university, once in every three months. The marks scored by the students shall be displayed on the Notice board and a copy forwarded by HOD shall be sent to the University once in every 3 months.

Theory – 5 marks
Practical – 5 marks
Total - 10 marks

Topics for each Assessment
1. Cell & chemistry of carbohydrates,lipids and proteins
2. Enzymes,vitamins and minerals
3. Metabolism of carbohydrates, lipids and proteins
4. Hemoglobin,immunoglobulin,Nutrition and acid base disorders
5. Hormones,connective tissue,metabolism of xenobiotics and oxygen toxicity
6. Molecular biology

11. **RECORD NOTE / LOG BOOK**

Record shall be maintained and assessed periodically by faculty and HOD. Institution shall provide adequate number of cases/teaching materials as specified in Dental Council of India regulation for the students during clinical/practical training and examinations.

12. **Recommended Books:**

1. D.M Vasudevan ,Text book of Biochemistry for Dental students
2. Ambika Shanmugam's Text book of Biochemistry

13. **Referrence Books**:

1. Harper's Illustrated Biochemistry
2. Lippincotts Illustrated reviews
3. Text book of Biochemistry with clinical correlations 1997, T.N. Pattabiraman
4. Basic and applied Dental Biochemistry, 1979, R.A.D. Williams & J.C.Elliot.

4. GENERAL PATHOLOGY

1. **GOAL**

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.

2. **OBJECTIVES**

a. KNOWLEDGE AND UNDERSTANDING:

- To demonstrate and analyze pathological changes at macroscopic and microscopic levels and explain their observations in terms of disease processes.
- To integrate knowledge from the basic sciences, clinical medicine and dentistry in the study of Pathology.
- To demonstrate understanding of the capabilities and limitations of morphological pathology in its contribution to medicine, dentistry and biological research.
- To demonstrate ability to consult resource materials outside lectures, laboratory and tutorial classes.

b. SKILLS:

- A dental graduate should be able to identify the abnormal diseases like tumor, non tumours and also to arrive what are the investigations needed for the diagnosis of the diseases.
- Carry out certain investigations and ability to interpret lab findings.

c. ATTITUDE:

- A dental student must be willing to apply the knowledge gained in pathology in the best interest of the patient and the community.
- Maintain a high standard of professional ethics In patient care and also in carrying out the diagnostic modalities.
- Willing to update knowledge in pathological conditions and diagnostic investigations from time to time.

d. INTEGRATION

The dental student must be able to integrate the pathological aspects with the diseases so that it helps to understand the disease nature and management of the disease.

e. COMPUTER PROFICIENCY

Basic knowledge of Computers, MS Office, Window 2000, Statistical Programmes. Basic operative skills in analysis of data and knowledge of multimedia. Students should utilize a combination of traditional classroom courses and online courses. The following validation is required and must be completed.

i. Technological Requirements for all Graduate Students
ii. A laptop or desktop computer that supports the following requirements
    a. Operating system requirements
    b. Internet browser requirements
    c. Reliable and consistent access to the internet
    d. Antivirus software which is current and consistently updated
    e. Microsoft Office
    f. Adobe Reader (or equivalent to view PDF files)

f. KNOWLEDGE ABOUT INFECTION AND CROSS INFECTION IN DENTISTRY

Knowledge about asepsis – disinfection and sterilization of instruments, clinical area / personal care as per universal protection, and disposal of medical wastes in the appropriate modes. Students should be aware of the rules and regulations pertaining to maintenance of clinical set up and waste disposal.

3. **COMPETENCIES**

1. General skills
2. Practice Management
3. Communication and Community Resources
4. Patient Care – Diagnosis
5. Patient Care - Treatment Planning
6. Competencies specific to subject

4. **TEACHING HOURS**

Lecture hours - **55**
Practical hours - **55**
Total hours **110 hours**

5. **TEACHING METHODOLOGY**

Lectures, symposiums, vertical and horizontal integrated teachings, viva voce, CMEs etc.The objectives of teaching General Pathology 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 feedback from the students
f) Integrated Teaching
g) Symposium and continuing medical education programmes

6. **THEORY SYLLABUS**

TOPIC	MUST KNOW	DESIRABLE TO KNOW	NICE TO KNOW
Introduction	Cellular responses to stress & noxious stimuli, cellular adaptation of growth & differentiation (hyperplasia, hypertrophy, atrophy & metaplasia) Cell injury and cell death (cause & mechanism of reversible & irreversible injury) Morphology of cell injury (reversible & necrosis), examples of cell injury and necrosis (ischemic, hypoxic, reperfusion and chemical injuries)	Historical aspects; definition of terms; introduction to pathology, its applications and role in patient management.	

	Apoptosis and sub-cellular responses to injury Intracellular accumulation, calcification & cellular aging; (Lipid, protein, glycogen and pigment accumulation; pathologic calcification; ageing)		
Inflammation/ Repair	Introduction to body's immune response (innate & adaptive immunity; cells and tissues of immune system; cytokines; structure & function of HLA) General features of inflammation; history; stimuli for acute inflammation; vascular events; cellular events - leucocyte adhesion and transmigration Continuation of cellular events (chemotaxis, phagocytosis, defects of leucocyte function); termination of acute inflammatory response; outcome of acute inflammation; morphological patterns of acute inflammation; Chemical mediators (vasoactive amines; plasma proteins; AA metabolites; PAF; cytokines; chemokines; leucotrienes; NO; free radicals & neuropeptides) Chronic inflammation (cause, morphological features; cells of chronic inflammation; granuloma; systemic effects of inflammation; consequences of excessive/defective inflammation) Repair (healing; scar formation; cutaneous wound healing); Repair (continued) (healing at special sites; factors		

	affecting wound healing)		
Haemodynamic disturbances	Oedema, Hypotension, congestion, haemorrhage & haemostasis Thrombosis & embolism Infarction, Shock		
Disorders of Immunity	Disorders of immunity – mechanisms of hypersensitivity, Graft Rejection Autoimmunity – SLE Primary & secondary immunodeficiency Amyloidosis	Rheumatoid arthritis, systemic sclerosis, Sjogren's, MCD,	
Neoplasia	Definition, nomenclature, biology of tumour growth, differences between benign & malignant tumours Tumour spread & epidemiology Molecular basis of Neoplasia (essential alterations for malignant transformation, oncogenes, suppressor genes) Evasion of apoptosis; defects in DNA repair, telomerase and angiogenesis; invasion & metastasis; dysregulation of genes) Carcinogenesis (carcinogenic agents, molecular basis of carcinogenesis) Host defense, tumour immunity, clinical features, and laboratory diagnosis.		
Infectious	Mycobacterial infections – tuberculosis HIV & Hepatitis	Typhoid, syphilis	General principles

diseases	Viruses	and others Fungal & parasitic infections	(categories, transmission & dissemination of microbes, mechanisms of microbial disease, immune evasion, infections in immunosuppressed hosts, tissue response to microbes) Pathology of common viral & bacterial infections (CMV, EBV, HPV, viruses, gram positive & negative bacterial infections)
Nutritional		Nutritional diseases	
RBC & bleeding disorders	Development of haematopoietic cells, bone marrow, classification of anaemia Iron deficiency anaemia, Megaloblastic anaemia Bleeding disorders – classification, disorders of platelets Coagulation disorders		
WBC, lymph node, spleen	Leukaemia – classification, aetiology, acute leukaemias. Chronic leukaemias, MDS, other chronic myelo-	Non-neoplastic quantitative and qualitative disorders of	

	proliferative disorders including myelofibrosis Hodgkin Lymphoma Blood banking	leucocytes Non-neoplastic disorders of lymph node, spleen & thymus; classification of lymphoma	
Systemic Pathology	Atherosclerosis Hypertension, vasculitis	Congenital anomalies, aneurysms, tumors.	
The Heart	Ischemic heart disease & myocardial infarction Rheumatic fever; Infective endocarditic	Congenital heart disease, diseases of the myocardium, tumors of the heart; diseases of the pericardium	
Head and neck	Benign and malignant lesions of head and neck including oral cavity, salivary glands		
Kidney	Nephrotic syndrome – pathogenesis and pathology	Normal structure, congenital anomalies, cystic disease, laboratory tests in renal disease.	
Endocrine system	Diabetes mellitus		
Bone & Joints	Infections, metabolic disease of bone Bone tumours/Jaw tumours		

Bioethics

Bioethics is the application of ethics to the field of medicine and healthcare. Bioethics includes medical ethics, which focuses on issues in health care; research ethics, which focuses issues in the conduct of research; Environmental ethics, which focuses on issues pertaining to the relationship between human activities and the environment and public health ethics.

7. **PRACTICALS**:

PROCEDURES:

1. Urine – Tests for Abnormal constituents Sugar, albumin, ketone bodies, Blood, bile salts, bile pigments.
2. Haemoglobin (Hb) estimation as OSPE
3. Total WBC count from the peripheral smear
4. Differential WBC Count and commenting on the peripheral smear
5. Blood grouping as OSPE

DEMONSTRATIONS

6. Packed cell volume(PCV,) Erythrocyte Sedimentation Rate (ESR)
7. Bleeding Time & Clotting Time
8. Histopathology Tissue Processing Staining
9. Histopathology slides

   Acute appendicitis
   Granulation tissue
   fatty liver
   CVC lung
   CVC liver
   CVC Spleen
   Lipoma
   Teratoma
   Tuberculosis of Lymph node
   Maduramycosis
   Actionomycosis

Rhinosporidiosis
Basal cell Carcinoma
Squamous cell Carcinoma
Malignant melanoma,
Ameloblastoma,
Squamous papllioma
Hodgkins Lymphoma
Pleomorphc adenoma
Cavernous hemangioma
Capillary hemangioma
Osteosarcoma
osteoclastoma

HEMATOLOGY SLIDES

Iron deficiency anemia
Acute Myeloid Leukemia
Chronic Myeloid Leukemia
Eosinophila

LIST OF SPECIMENS:

i. cute appendicitis
ii. Fatty liver
iii. CVC lung
iv. CVC Liver
v. Infarct spleen
vi. TB lymph Node
vii. Lipoma
viii. Myxoma
ix. Chondroma
x. Squamous cell carcinoma
xi. Pleomorphic adenoma

xii. Teratoma
xiii. Malignant Melanoma

Instruments:

i. RBC Pipette
ii. WBC Pipette
iii. ESR Westergrens tube
iv. SAHLI'S hemoglobinometer
v. PCV tube
vi. Bone marrow biopsy needle
vii. Bone marrow aspiration needle

8. **THEORY EXAMINATION (TITLE AND QP PATTERN WITH MARKS)**

Part A - Pathology:
Essay 1X10 = 10 Marks
Short notes 3X 5 = 15 Marks
Short Answers 5X2 = 10 Marks

Total = 35 Marks

9. PRACTICAL EXAMINATIONS- experiments, slides and OSPE
Lab experiments 45 marks
Major experiment – Hematology -
Peripheral smear/ DC - 15 Marks, 45 Minutes
Urine analysis - 10 Marks, 30 Minutes
Minor experiment(OSPE) - 10 Marks, 20 Minutes (for Hb%)
Spotters - 10 Marks, 20 minutes

Total 45 marks

Viva - 10 marks

SPOTTERS:

i. Histo pathology slides
ii. Haematology slides
iii. Gross specimens
iv. Instruments

Scheme for practical examinations
Procedure
Demonstrations
Viva

	Examination	Internal Assessment	Viva	Total
Theory	35	5	10	50
Practicals	45	5	-	50
Total				100

10. FORMATIVE/INTERNAL ASSESSMENT

The continuing assessment examination (both Theory/Practical) held at least 3times in a particular year and best of two examinations shall be considered. The Internal Assessment marks to be submitted to the University, once in every three months. The marks scored by the students shall be displayed on the Notice board and a copy forwarded by HOD shall be sent to the University once in every 3 months.

Topics:

i. Cell injury and adaptations,Inflammation wound healing
ii. Hemodynamic changesNeoplasia
iii. Infectious diseasesNutritional disorders

iv. Disorders of circulations, Immunity, Diseases of oral cavity
v. Diseases of the salivary glands, Bones, cardiovascular system
vi. Hematology(RBC, WBC AND PLATELETS, LYMPHNODE, SPLEEN AND THYMUS)

Theory - 5 Marks
Practical - 5 Marks
Total - 10 marks

11. RECORD NOTE / LOG BOOK:

Record shall be maintained and assessed periodically by faculty and HOD. Institution shall provide adequate number of cases/teaching materials as specified in Dental Council of India regulation for the students during clinical/practical training and examinations.

12. TEXT BOOKS

i. Robbins BASIC PATHOLOGY – by Kumar, Abbas and Aster- 1st South Asia edition
ii. Text book of Pathology By Harsh Mohan 7th Edition
iii. Andersons pathology Volume 1 And 2 by Ivan Damjanov & James Linder
iv. 3.Wintrobe's Clinical Hematology by Lee, Bithell,Forster.

13. REFERENCE BOOKS:

i. Robbins – Pathologic Basis of Diseases By Kumar and Kotran 10th Edition.
ii. Ackermann Surgical Pathology
iii. Microbiology – Prescott, et al.
iv. Microbiology – Bernard D. Davis, et al.
v. Clinical & Pathogenic Microbiology – Barbara J Howard, er al.
vi. Mechanisms of Microbial diseases – Moselio Schechter, et al.
vii. Immunology an Introduction – Tizard
viii. Immunology 3rd edition – Evan Roitt, et al.

MICROBIOLOGY

1. GOAL

To introduce the students to the exciting world of microbes and to provide an understanding of various branches of Microbiology, in order to deal with the etiology, pathogenesis, laboratory diagnosis, treatment, control and prevention of infections in dental practice.

2. OBJECTIVES

a. KNOWLEDGE AND UNDERSTANDING:

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

i. Understand the basics of various branches of Microbiology and able to apply the knowledge relevantly.
ii. 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.
iii. Understand and practice various methods of Sterilisation and disinfection in dental clinics.
iv. Have a sound understanding of various infectious diseases and lesions in the oral cavity.
v. Awareness of Health care associated infections and their prevention in dental practice

b. SKILLS

i. Student should have acquired the skill to diagnose, differentiate various oral lesions.
ii. Should be able to select, collect and transport clinical specimens to the laboratory.
iii. Should be able to carry out proper aseptic procedures in the dental clinic.
iv. Interpretation of antimicrobial susceptibility tests and to make right choice of antibiotic based on spectrum of infection and ensure appropriate use to avoid antibiotic resistance.

c. ATTITUDE:

i. To apply knowledge in the interest of the individual patient and community.
ii. Maintain high standards of professional ethics in patient care and in carrying out diagnostic tests.

iii. To update knowledge from time to time with regard to diagnostics and immunoprophylaxis.

d. INTEGRATION:

At the end of integrated teaching the student shall acquire integrated knowledge from different disciplines which includes etiology,morphology,pathogenesis, clinical features,laboratory diagnosis,treatment,prevention and control of infectious diseases.

e. KNOWLEDGE ABOUT INFECTION AND CROSS INFECTION IN DENTISTRY

Knowledge about asepsis – disinfection and sterilisation : of instruments , clinical area/ personal care as per universal protection, and disposal of medical wastes in the appropriate modes. Students should be aware of the rules and regulations pertaining to maintenance of clinical set up and waste disposal.

f. COMPUTER PROFICIENCY:

Basic knowledge of Computers, MS Office, Window 2000, Statistical Programmes Basic operative skills in analysis of data and knowledge of multimedia. Students should utilize a combination of traditional classroom courses and online courses. The following validation is required and must be completed.

i. Technological Requirements for all Graduate Students
ii. A laptop or desktop computer that supports the following requirements

a) Operating system requirements
b) Internet browser requirements
c) Reliable and consistent access to the internet
d) Antivirus software which is current and consistently updated
e) Microsoft Office
f) Adobe Reader (or equivalent to view PDF files)

3. COMPETENCIES

1. General skills
2. Practice Management

3. Communication to Community Resources
4. Patient Care – Diagnosis
5. Patient Care - Treatment Planning
6. Competencies specific to the subject

4. TEACHING HOURS

- Lecture hours 65
- Practical hours 50

Total hours 115

5. TEACHING METHODOLOGY

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
f) Integrated Teaching
g) Symposium and continuing medical education programmes.

6. THEORY SYLLABUS

TOPIC	MUST KNOW	DESIRABLE TO KNOW	NICE TO KNOW
Introduction, History	Noble laureates and their contributions to medical microbiology, Detailed contributions of Louis Pasteur, and Robert Koch		
	Morphology physiology, classification of bacteria, different methods of staining		
	Sterilization and disinfection including sterilization controls		

	Different types of culture media and culture techniques including anaerobic culture methods.	Bacterial genetics and drug resistance in bacteria	
	Specimen Collection, Transport processing and Identification of bacteria		Testing of disinfectants
	Infection-source, mode of transmission and types of infectious disease		
Immunology	1.Immunity 2.Antigen 3.Immunoglobulins 4.Structure and functions of immune system 5.Antigen -Antibody reactions 6.Immune response 7.Hypersensitivity 8. Auto immunity, classification with special reference to autoimmune disorders involving oral cavity. 9.Immunodeficiency disorders-various types and disorders relevant to dentistry 10.Immunology of transplantation and malignancy	Complement system Immunohaematology	Flow cytometry in the diagnosis of malignancies Vaccines against tumors
Systematic bacteriology	1.Gram positive cocci - Staphylococcus, Streptococcus with special reference to Viridans group, Pneumococcus 2.Gram negative cocci – Meningococcus and Gonococcus 3.Corynebacterium diphtheria including immunoprophylaxis 4.Clostridium – Gas Gangrene, Tetanus and food poisoning 5.Mycobacteria- M.tuberculosis and M.leprae 6. Non sporing anaerobes – classification , pathogenesis, Laboratory diagnosis and treatment.	Enterobacteriaceae Vibrio cholera	MDR and XDR TB Agents of Bioterrorism

	7.Spirochaetes- Treponema, Borrelia vincenti 8.Actinomycetes 9.Normal flora of oral cavity		
Virology	1.General properties, resistance cultivation of viruses, host virus interactions with special reference to interferon 2.Laboratory diagnosis , Viral vaccines 3.Herpes virus 4.Measles , Mumps and Rubella 5.Rabies virus 6.Hepatitis B and Hepatitis C virus,HBV vaccine 7.Human Immunodeficiency virus	Bacteriophage structure and significance Cultivation of viruses	Influenza A and B viruses
Mycology	1.Introduction,classification, Laboratory diagnosis 2.Candidosis,Rhinosporidiosis 3.Systemic mycoses and associated oral lesions.	Opportunistic fungal infections	Antifungal susceptibility testing methods
Parasitology	1.Introduction , different modes of transmission and prevention 2.Entamoeba histolytica, Entamoeba gingivalis 3.Malarial parasites 4.Leishmania including L.brasiliensis 5.Common helminthic infections – Tape worms, Ascaris lumbricoides, Ancylostoma duodenale, Trichuris trichura and Enterobius vermicularis.	Protozoa Giardia intestinalis, Trichomonas species. Wuchereria bancrofti	Parasitic infections in HIV
Applied Microbiology	1.Standard precautions 2.Infection control measures in dental setting 3.Significance of antibiotic susceptibility testing ,its interpretation 4.Bio medical waste management guidelines 5..Vaccination for Health care providers 6..Needle stick injury and post exposure prophylaxis 7.Blood borne infections	STD infections Infective endocarditis Emerging and Re emerging infections	Antibiotic resistance (MRSA,ESBL etc.)

Bioethics

Bioethics is the application of ethics to the field of medicine and healthcare. Bioethics includes medical ethics, which focuses on issues in health care; research ethics, which focuses issues in the conduct of research; environmental ethics, which focuses on issues pertaining to the relationship between human activities and the environment, and public health ethics.
In microbiology, the maintenance of confidentiality is very important for the laboratory to gain confidence from the patients. Confidentiality is mandatory in certain tests like HIV testing as the results may lead to alienation from the family thus causing mental agony to the patient. Counselling has to be given both before and after testing in HIV /AIDS setting. Written consent has to be always obtained from the patient for any procedure that can potentially harm the individual particularly invasive techniques.
Quarantining of people is done under special circumstances. By adhering to ethical guidelines, members of the medical profession can help and ensure that quarantine and isolation measures achieve their public health goals and maximally promote the well-being of individuals.

7. PRACTICALS

Procedures
i. Simple stain, Hanging drop
ii. Grams stain
iii. Ziehl Neilsen's stain

Demonstrations
i. Microscopy-Different types, parts, maintenance and usage
ii. Sterilization and disinfection
iii. Culture media including anaerobic culture media and transport media
iv. Anaerobic culture methods
v. Biochemical reactions in the identification of bacteria
vi. Virus models

8. THEORY EXAMINATION

Part B – Microbiology:

Essay	1 X 10	=	10 Marks
Short Notes	3 X 5	=	15 Marks
Short Answers	5 X 2	=	10 Marks

Total		=	35 Marks

Note: Essay from Systematic Bacteriology/Virology, General bacteriology Immunology
Short Notes from Systematic bacteriology, Virology, Mycology, Parasitology, Applied Microbiology
Short Answers from General bacteriology, Immunology, Systematic bacteriology, Virology, Mycology, Parasitology and Applied Microbiology.

9. PRACTICAL EXAMINATION

Contents	Marks	Time duration
Spotters (10x 2marks each)	20	30mts
Gram staining (GPC,GNB,MIXTURE)	10	45 mts
Ziehl Neilsen's staining	10	60mts
*OSPE	5	45mts
Total	45marks	180mts(3hrs)

*OSPE Exercises Eg. Hand washing Technique
Bio medical waste segregation
OR any other relevant topic of choice
Note : For OSPE,key to be prepared and made available to the examiners .

Viva – Marks 10
To be conducted in the afternoon with appropriate time interval.

	Examination	Internal Assessment	Viva	Total
Theory	35	5	10	50
Practicals	45	5	-	50
Total				100

10. FORMATIVE /INTERNAL ASSESSMENT

The continuing assessment examination (both Theory/Practical) held at least 3times in a particular year and best of two examinations shall be considered. The Internal Assessment marks to be submitted to the university, once in every three months. The marks scored by the students shall be displayed on the Notice board and a copy forwarded by HOD shall be sent to the University once in every 3 months.

Theory - 5 marks
Practicals - 5 marks
Total - 10 marks

11. RECORD NOTE / LOG BOOK

Record shall be maintained and assessed periodically by faculty and HOD. Institution shall provide adequate number of cases/teaching materials as specified in Dental Council of India regulation for the students during clinical/practical training and examinations.

12. TEXT BOOKS

i. Text book of Microbiology – R.Ananthanarayan & C.K.Jayaram Paniker.
ii Medical Microbiology – David Greenwood etal.
iii. Textbook of parasitology – K.D.Chatterjee
iv. Paniker's Text book of Medical Parasitology

13.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 –Donald M Weir
vi. Immunology 3rd edition – Evan Roitt , etal.
vii. Oral microbiology and infectious diseases –Burnett and Scherp
viii.Jawetz text book of microbiology

6. DENTAL MATERIAL

1. **GOAL**

The dental graduates during training in the institutions should acquire 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. 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 about the various materials. The broad goal of the teaching of undergraduate students in Dental Materials aims at providing adequate fundamental knowledge about the materials available in the Dental science. .

2. **OBJECTIVES**

The objectives are dealt under three headings namely (a) knowledge and understanding (b) skills and (c) attitudes.

a. KNOWLEDGE AND UNDERSTANDING:

The graduate should acquire the following during the period of training --- Adequate knowledge of the scientific foundations on which dentistry is based and good understanding of various relevant scientific methods, principles of biological functions and should be able to evaluate and analyse scientifically various established facts and data. To understand the evolution and development of science of dental materials. To know about the manipulation technique of various restorative materials.

b. SKILLS:

A graduate should be able to demonstrate the following skills necessary for practice of dentistry. To develop skills in the management of various materials in dentistry. Students should know about the physical and chemical properties of the dental materials

c. ATTITUDE:
A graduate should develop during the training period the following attitudes. Willing to apply current knowledge of dentistry in the best interest of the patients and the community. Maintain a high standard of professional ethics and

conduct and apply these in all aspects of professional life. Seek to improve awareness and provide possible solutions for oral health problems and needs throughout the community. Willingness to participate in the continuing education programmes to update knowledge and professional skills from time to time. To help and to participate in the implementation of National Health Programmes.

d. INTEGRATION:

e. KNOWLEDGE ABOUT INFECTION AND CROSS INFECTION IN DENTISTRY:

Knowledge about asepsis – disinfection and sterilization of instruments, clinical area / personal care as per universal protection, and disposal of medical wastes in the appropriate modes. Students should be aware of the rules and regulations pertaining to maintenance of clinical set up and waste disposal.

f. Computer Proficiency

Basic knowledge of Computers, MS Office, Window 2000, Statistical Programmes. Basic operative skills in analysis of data and knowledge of multimedia.Students should utilize a combination of traditional classroom courses, and online courses. The following validation is required and must be completed

i. Technological Requirements for all Graduate Students
ii. A laptop or desktop computer that supports the following requirements
   a) Operating system requirements
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   c) Reliable and consistent access to the internet
   d) Antivirus software which is current and consistently updated
   e) Microsoft Office
   f) Adobe Reader (or equivalent to view PDF files)

3. **COMPETENCIES**

1. General skills
2. Practice Management
3. Communication and Community Resources
4. Patient Care – Diagnosis

5. Patient Care - Treatment Planning
6. Competencies specific to the subject

4. **TEACHING HOURS**

Teaching hours for first and second years- Theory and Practical are shown in the Tables-I
TABLE - I Subjects and Hours of Instruction (B.D.S Course)

TOTAL TEACHING HOURS FOR FIRST AND SECOND B.D.S

Sl No	Subject	Lecture Hours	Practical Hours	Clinical Hours	Total HOURS
1.	Dental Materials	80	240	-	320

Subjects and Hours of Instruction for First year B.D.S

Sl No	Subject	Teaching Hours	Practical Hours	Clinical Hours	Total
1.	Dental Materials	20	40	_	60

Subjects and Hours of Instruction for Second year B.D.S

Sl No	Subject	Lecture Hours	Practical Hours	Clinical Hours	Total Hours
1.	Dental Materials	60	200	--	260

5. **TEACHING METHODOLOGY**
The objective of teaching can be achieved by various teaching tech such as

i. Lecture
ii. Demonstration
iii. Practical exercises
iv. Audio Video aids
v. Group discussion
vi. Integrated teaching

Titles of subjects of study

First Year

Dental Materials.

Second Year

Dental Materials.

6. **THEORY SYLLABUS**

TOPICS	MUST KNOW	DESIRABLE TO KNOW	NICE TO KNOW
Introduction	Brief History of the development of the science of Dental Materials. Aim of studying the subject of Dental Materials. Scope and requirements of Dental materials . Spectrum of materials - Classification Clinical and laboratory applications		
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.,	Change of state Interatomic bonds Crystalline structure Non crystalline solids and their structure	
Important Physical properties	Hue, value, chrome. and translucency physical properties based on laws of optics, dealing with phenomena of light, vision and sight. Thermal		

applicable to dental. Materials	conductivity & coefficient of thermal expansion, 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 6reep, flow, colour, three dimensional colour - hue, values, chrome., Munsell system, metamerisim, fluorescence.		
Biological considerations in use of dental materials.	Classification of materials from perspective of biological compatibility	Micro leakage, Thermal changes, Galvanism, toxic effect of materials	Biological evaluation for systemic toxicity, skin irritation, mutagenicity and carcinogenicity.
Gypsum & gypsum products	Gypsum - its origin, chemical formula. Dental plaster, Dental stone, Die stone, high strength, high expansion stone. Application and manufacturing procedure of each, macroscopic and microscopic structure of each. Commercial names. Chemistry of setting, setting reaction, theories of setting, gauging water, Microscopic structure of set material. Setting time: working time and	Recent methods or advanced methods.	Disinfection of dental materials for infection control. Any recent advancements in material and mixing devices.

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	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. ADA classification of gypsum products Description of impression plaster and dental investment Manipulation Disinfection : infection control, liquids, sprays, radiation Method of use of disinfectants Storage of material - shelf life		
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. 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, Type of impression trays required, Adhesion, to Tray, manipulation, instruments &equipment's required. Techniques of impression, storage	Visible light cure polyether urethane dimethacrylate, Historical background , development Of each impression material,	

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	of impression, 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 and disadvantages of each material.		
Synthetic resins used in dentistry.	Classification of resins, Dentalresins. Requirements of dental resins, applications, polymerisation, polymerisation mechanism. Stages in addition polymerisation, inhibition of polymerisation, copolymerisation, molecular weight, crosslinking, plasticisers. 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. Physical properties of denture base resin. Composite RESTORATIVE RESIN: Mode of supply, Composition, Polymerisation mechanisms: Chemically activated, Light activated, Dual cure: Degree of conversion, Polymerisation Shrinkage Classification of Composites: Application, composition arid properties of each. Biocompatibility ,-- micro leakage, pulpal reaction, pulpal protection Manipulation of composites:	Historical background and, development of material. Miscellaneous resins & techniques: Repair resins, Relining and rebasing. Infection control in detail, Biological properties and allergic 'reactions. Measurement of bond strength and micro leakage Amalgam Bonding Pit and fissure sealants.	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. Composites of posterior teeth, Prosthodontics resins for veneering. Repair of composite. Extended application for composites: Resins for restoring eroded teeth, Pit and fissure sealing, Resin inlay system Indirect & direct, Core build up, Orthodontic applications.

	Techniques of Insertion of Chemically activated, light, activated, dual cure Polymerisation, Finishing and polishing of restoration, Direct Bonding: Need for bonding, Acid' etch technique,, Enamel bonding, Dentin bonding agents. Mode of bonding, Bond strength, Sandwich technique its indication and procedure.	Restorative Resins Depth of cure Degree of conversion, Dual Cure resins	**Restorative Resins** Curing lamps Depth of cure Reduction of residual stresses
Metal and alloys	Structure and behaviour of metals, Classification of casting alloys: By function & description. Alloys for crown & bridge, metal ceramic & removable partial denture. Composition,, function, constituents and application.	Historical background, desirable properties of casting alloys Factors affecting success of amalgam	An alternative to metal casting process. Cad-cam process for metal & ceramic inlays
	Dental Amalgam Composition,Manufacturing of alloy powder,Amalgamation,Dimensional Stability,StrengthCreep,Clinicalperformance,Proportioning,Trituration,Condensation,Carving and finishing, Dimensional Change, Mercury hygiene	Side effects of mercury Repair of amalgam restoration	
Direct filling gold	Properties of pure gold Classification and forms of DFG Removal of surface impurities	History, Compaction Direct gold restoration	

Dental casting alloys	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. Propertiesof alloys: Melting range, mechanical properties, hardness, and elongation, modulus ofelasticity, 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	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 for 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 ofCAD- CAM technology . Another method of making copings - by copy milling (without casting Procedures
Dental waxes including inlay casting wax	Introduction and importance of waxes. Sources of natural waxes and their chemical nature. Classification of Waxes: Properties of Dental wax, Inlay wax. Mode of supply composition, Ideal requirements.Properties: melting range, thermal expansion, mechanical properties, flow & residual stresses, ductility. Dental Wax: Inlay wax: Mode: Classification & composition,	.	Manipulation of inlay wax: Instruments & equipment required. Impression wax for corrective impressions, Bite registration wax.

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Dental casting investments.	Ideal requirements: Properties of inlay wax: Flow, thermal properties Wax distortion & its causes. Definition, requirements, classification Gypsum bonded - classification. Phosphate bonded, 'Silica bonded'. Mode of Supply:,Composition, application , setting mechanism, setting time & factors controlling it. Expansions :Setting expansion, Hygroscopic Setting expansion, & thermal expansion : Factors affecting. Properties: Strength, porosity, and fineness & storage. Technical considerations:		Casting procedure, Preparation of die, Wax pattern, spruing, investing, and control of shrinkage compensation, wax burnout, and heating the invested ring, casting. Casting machines, source of heat for melting the alloy. Defects in casting.
Soldering, brazing and welding	Need of joining dental appliances, temperature, and 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 Welding: Definition, application, requirements,and procedure.	Technique of Soldering & Brazing : free hand soldering and investment, steps and Procedure.	weld decay - causes and how to avoid it. Laser welding. Titanium alloys, application, composition, properties, welding, Corrosion resistance
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		

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	Properties required for orthodontic wires, working range, springiness, stiffness, resilience, Formability, ductility, ease of joining, corrosion resistance, stability in oral environment, biocompatibility 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		
Dental cements	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. Definition & Ideal requirements. Fluoride releasing cements Luting cements Agents for pulp protection Zinc Phosphate cement Zinc Polycarboxylate Cement Glass ionomer cement		Modifications and recent advances, Principles of cementation. Special emphasis on cavity liners and cement bases and luting agents.

Dental ceramics	Resin Cements Zinc oxide eugenol cement Calcium Hydroxide General applications. Dental ceramics: properties 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, aesthetic properties, biocompatibility, technical considerations. Metal Ceramics (PFM): Alloys - Types and composition of alloys. Ceramic - Type and Composition.	Historical background. Methods of strengthening. Metal Ceramics (PFM).Metal Ceramic Bond.Metal Ceramic Bond - Nature of bond. Bonding using electro deposition, foil copings, bonded platinum foil, swaged gold alloy foil coping. Technical considerations of porcelain and porcelain fused metal restorations.	Recent advances - all porcelain restorations, Manganese core, injection moulded, cast able ceramics, glass infiltrated alumina core ceramic (In ceram), ceramic veneers, inlays and on lays, and CAD - CAM ceramic.
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	Technical consideration - Material and procedure used for abrasion and polishing,	

Die and counter die materials Mechanics of cutting Dental implants	oxide, sand, carbides, diamond, zirconium silicate, Zinc oxide Desirable 'characteristics of an abrasive, Rate of abrasion, Size of particle, pressure, Grading of abrasive & polishing agents. Binder, Polishing materials & procedures Types - Gypsum products, Electroforming, Epoxy resin, Amalgam. Burs and points.		Evolution of dental implants, - types and materials.

Bioethics

Bioethics is the application of ethics to the field of medicine and healthcare. Bioethics includes medical ethics, which focuses on issues in health care; research ethics, which focuses issues in the conduct of research; environmental ethics, which focuses on issues pertaining to the relationship between human activities and the environment, and public health ethics

BIO-ETHICS

1) Respect human life with dignity
2) Refrain from supporting crimes against humanity
3) Treat the sick with compassion
4) Protect the privacy of the patient
5) Educate the public
6) Fight for socio economical changes
7) Teaching and mentoring those who follow us

7. PRACTICAL

Practical Exercises: 240 Hours
Demonstration of manipulation of all materials
Exercises to be done by each student:

a. Manipulation of Gypsum- Materials and Alginate - identify setting time and working time and working time with reference to proportion, water temp, and spatulation time.
b. Self-cure and heat cure acrylic resin manipulation and curing.
c. Cements - manipulation and studying setting time and working time for luting, base & restoration. Zinc oxide eugenol,zinc phosphate,glass ionomer .
d. Silver Amalgam - manipulation, trituaration.

8. **THEORY EXAMINATIONS: (3 Hours)**

Elaborate on	2 X 10	= 20 marks
Write Notes	10 X 5	= 50 marks

Total		70 marks

Note : One Elaborate on Question from Conservative Dentistry topics and one Elaborate on Question from Prosthodontics topics
Write Notes : Four Questions from conservative and four questions from Prosthetic topics and two questions from Metallurgy and orthodontia.

II Exercise to be done by each FIRST B.D.S student:

a. Impression material Manipulation - 20 hours
b. Gypsum products - 20 hours

9. PRACTICAL / CLINICAL EXAMINATIONS:-

I. i. Spotters: Identify and write the composition and two important uses:
ii. Spotters – 20 Nos. 20 X 2 = 40 marks
Time – 2 Minutes each

II. Exercise No.1
Any one exercise of the following 25 Marks
i. Manipulation of Dental plaster and stone
ii. Manipulation of alginate impression material
iii. Manipulation of Zinc Oxide Eugenol impression paste
iv. Manipulation of heat cure acrylic resin

III. Exercise No. 2 25 Marks
Manipulation of any one of the following Dental Cements.
a. ZOE (Luting and Filling consistency)
b. Zinc Phosphate Cement (Luting and Base consistency)
c. Glass lonomer Cement Type I/II (Luting/Filling consistency)
d. Silver Amalgam Trituration

TIMING FOR MANIPULATION

2-5 Minutes may be allotted for each mixing exercises

Viva 20 Marks

	Examination	Internal Assessment	Viva	Total
Theory	70	10	20	100
Practicals	90	10	-	100
Total				200

10. FORMATIVE / INERNAL ASSESSMENT:

The continuing assessment examination (both Theory/Practical) held at least 3times in a particular year and best of two examinations shall be considered. The Internal Assessment marks to be submitted to the university, once in every three months. The marks scored by the students shall be displayed on the Notice board and a copy forwarded by HOD shall be sent to the University once in every 3 months.

11. RECORD NOTE / LOG BOOK:

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12. TEXT BOOKS

Name of the Book & Title	**Author**	**Edn**	**Yr. of Publ.**	**Publ.'s Name Place of Publ.**
Science of Dental Materials	Kennet. J. Anusavice	11th	2007	W.B. Sunder's Company, USA
Notes on Dental Materials	E.C. Combe	06th	1992	Churchill Livingstone, UK
Applied Dental Material	John. F. Mc. Cabe	07th	1992	Oxford Blackwell Scientific pub. London
Text Book of Dental Material	Craig.	06th	1996	Mosby, USA
Restorative Dental	O. Brien Craig.	11th	2002	Mosby, USA

LIST OF SPOTTERS
CONSERVATIVE SPOTTERS:
1. Amalgam Alloy Powder

2. Mercury
3. Amalgam Capsule
4. Acid Etchant
5. Dentin Bonding Agent
6. Cavity Varnish
7. Dentin Conditioner
8. Composite Resin
9. Zinc Oxide Eugenol Cement
10. Modified Zinc Oxide Eugenol Cement (Irm – Intermediate Restorative Material)
11. Zinc Phosphate Cement
12. Zinc Polycarboxylate Cement
13. Glass Ionomer Cement Type I
14. Glass Ionomer Cement Type Ii
15. Calcium Hydroxide
16. Inlay Wax
17. Base Metal Alloy Pellets
18. Casting Ring
19. Gypsum Bonded Investment
20. Phosphate Bonded Investment
21. Dental Bur
22. Wooden Wedges
23. Gutta Percha Points
24. Gutta Percha Sticks
25. Motor And Pestle
26. Glass Slab
27. Cement Spatula
28. Agate Spatula

Prosthodontics spotters

1. plaster of paris
2. die stone
3. dental stone
4. gypsum bonded investment

5. zinc oxide eugenol impression paste
6. rubber base materials
7. alginate
8. impression compound
9. low fusing compound
10. sticky wax
11. shellac base plate
12. modelling wax
13. heat cure resin
14. self cure resin
15. metal pellets
16. casting ring
17. stainless steel wire
18. acrylic trimmers
19. separating media
20. acrylic teeth set
21. cotton puff
22. wollen puff
23. metal ceramic bridge

Miscellaneous

1. Infection control
2. Artificial tooth material.
3. Separating media
4. Die spacers
5. Tray adhesives
6. Petroleum jelly
7. Articulating paper
8. Pressure indicating paste
9. Endodontic materials
10. Comparative studies between metallic and nonmetallic denture base Bioglass
11. Sprues

12. Setting expansion, hygroscopic expansion, thermal expansion
13. Dentifrices.

13. REFERENCE BOOK:

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

7. PRE CLINICAL CONSERVATIVE DENTISTRY

1. **GOAL**

The IInd year BDS undergraduate students during the training in the preclinical conservative dentistry should acquire adequate knowledge, skills and attitude which are required for carrying out appropriate activities in dental practice which involves diagnosis treatment and prevention of disease of teeth. During the training program they should be able to identify and use instruments which are used in conservative dentistry and Endodontics. They should also be aware of various restorative procedures with emphasize on tooth conservation.

2. **OBJECTIVES**

The objectives are dealt under following headings

a. KNOWLEDGE AND UNDERSTANDING:

The student should acquire adequate knowledge during this period of training. Knowledge of the scientific foundation of conservative dentistry and understanding of various treatment procedures carried out in conservative dentistry with emphasize on biological principal to be followed during these treatment procedures and to acquire knowledge of various instruments and materials used in restorative procedures .They should also be aware of various manipulative techniques of restorative material.

b. SKILLS;

The students should be able to demonstrate the following skills which are necessary for practice in conservative dentistry To develop skills in manipulation of various materials used in conservative dentistry. To develop skills in preparation of various cavities and to perform various restorative procedures.

c. ATTITUDE;

The student should be able to apply the current knowledge of various materials used in dentistry in the interest of patients and the community in general. To be aware of recent developments in instruments and materials used in conservative dentistry and update his/her knowledge by attaining various continuing education programmes. Should be aware of both

benefits and health hazards of various restorative materials used in conservative dentistry. Should maintain high standard of professional ethics and apply those in all aspects of professional life.

d. INTEGRATION:

The dental student must be able to identify the healthy and diseased state of the teeth, thereby enabling them to better understand the diseased state and to plan an ideal treatment protocol for the same.

e. KNOWLEDGE ABOUT INFECTION AND CROSS INFECTION IN DENTISTRY

Knowledge about asepsis – disinfection and sterilization of instruments, clinical area / personal care as per universal protection, and disposal of medical wastes in the appropriate modes. Students should be aware of the rules and regulations pertaining to maintenance of clinical set up and waste disposal.

f. COMPUTER PROFICIENCY

Basic knowledge of Computers, MS Office, Window 2000, Statistical Programmes. Basic operative skills in analysis of data and knowledge of multimedia. Students should utilize a combination of traditional classroom courses, and online courses. The following validation is required and must be completed.

i. Technological Requirements for all Graduate Students
ii. A laptop or desktop computer that supports the following requirements
    a. Operating system requirements
    b. Internet browser requirements
    c. Reliable and consistent access to the internet
    d. Antivirus software which is current and consistently updated
    e. Microsoft Office
    f. Adobe Reader (or equivalent to view PDF files)

3**. COMPETENCIES**

1. General skills
2. Practice Management
3. Communication and Community Resources

4. Patient Care – Diagnosis
5. Patient Care - Treatment Planning
6. Competencies Specific to the Subject

4. **TEACHING HOURS**

During II nd year BDS

Lecture	25 hours
Practical	200 hours
Total	225 hours

5. **TEACHING METHODOLOGY**

Audio Visual Aids: LCD projectors
Identification of instruments used in preclinical dentistry.

Demonstration of various procedures in conservative dentistry.
Demonstration of endodontic procedures in single rooted teeth.

6. **THEORY SYLLABUS**

TOPIC	MUST KNOW	DESIRABLE TO KNOW	NICE TO KNOW
1.	Introduction to conservative dentistry		
2.	Definition and scope of conservative dentistry and Endodontics		
3.	Classification of cavities		
4.	Nomenclature		
5.	Various chair side positions		
6.	Tooth numbering		

7.	Dental caries		
8.	Restoration -Definition and objectives		
9.	Instrument classification ,nomenclature design formula of hand cutting instrument, grasps and rests		
10.	Rotary cutting instruments, bur design, abrasives and various speeds in rotary instruments. Principle of cavity preparation for (a) Silver amalgam (b)Cast gold inlays (c)Composite resin (d)Glass ionomer		
11.	Matrices, Retainers and wedges		
12.	Separators -Different methods of separation		
13.	Finishing and polishing of restorations		
14.	Management of deep carious lesions- pulp capping and pulpotomy		
15.	Access cavity preparation and brief introduction of instruments used endodontics.		
17.			Infection control
18.			Conservative aesthetic procedures
19.			Bleaching
20.			Complex amalgam restorations
21.			Direct filling gold

Bioethics

Bioethics is the application of ethics to the field of medicine and healthcare. Bioethics includes medical ethics, which focuses on issues in health care; research ethics, which focuses issues in the conduct of research; environmental ethics, which focuses on issues pertaining to the relationship between human activities and the environment, and public health ethics.

7. PRACTICALS:

Practical exercise: 200 hours

Preparation of 1 inch cube in plaster of paris-4 Nos
Preparation of geometric cavities in prepared cubes.
Preparation of tooth models in plaster and preparation of cavities and restoration with modelling wax

a) Incisors -3 Nos
b) Premolars- Upper Premolars -2 Nos; Lower Premolars- 2Nos
c) Molars - Upper Molars 4 Nos; Lower Molars-4Nos

Preparation of Cavities on Extracted Natural Teeth Class I, Class II and MOD and Class V Cavity Preparation. Base Application, Matrix and Wedge Placement, Placement of restoration.

1. Cavities:

S no	Cavities	Preparation	Restoration
	Class I	5	5
	Class I with extensions	2	2
	Class II DO conventional MO conventional Conservative preparation in Upper molar	10	10
	Class II MOD	2	2
	Class III and V	4	4 (glass ionomer)
	Class V	2	2(amalgam)

Finishing and polishing of above restorations

Inlay preparation:
Class II preparation
Wax pattern
Sprue attachment
Investment
Casting and finishing
Endodontics
Identification of basic endodon tic instruments
Access cavity preparation in upper central incisors
Working length determination
Cleaning and shaping
Obturation of the root canal
Access seal

Demonstration**:**
Demonstration of class III, class V and incisal edge restoration on extracted teeth with composite resin
Finishing and polishing of the restorations
Identification and manipulation of cavity varnishes, bases like zinc phosphate, zinc poly carboxylate, zinc oxide eugenol cement
Manipulation of glass ionomer cement
Manipulation of amalgam
Identification and demonstration of placement of different types matrix retainers, matrices and tooth seperators.
Demonstration of light cure composite and glass ionomer Restoration

Endodontics:
(a) Pulp capping direct indirect on extracted teeth
(b) Pulpotomy on extracted posterior teeth
(c) Root canal access cavity opening on upper Central Incisor (extracted teeth)
Demonstration of instrumentation and obturation of root canal

8. Theory Examination

No Theory Examination

9 .PRACTICAL EXAMINATIONS:

Practical exercise:

Preparation of class II cavity for Silver amalgam in maxillary or mandibular molar tooth (typhodont tooth)

S.no	Excercise	Marks	Time
1	Cavity Preparation	30	45 Minutes
2	Base and Matrix	10	15 Minutes
3	Restoration and Finishing	20	30 Minutes

	Total	60 marks	

Viva – voce - 20 Marks

SCHEME OF EXAMINATION:

Internal assessment - 20 marks
Practical - 60 marks
Viva voce - 20 marks
Total - 100 marks

10. FORMATIVE/INTERNAL ASSESSMENT:

The continuing assessment examination held at least 3times in a particular year and best of two examinations shall be considered. The Internal Assessment marks to be submitted to the university, once in every three months. The marks scored by the students shall be displayed on the Notice board and a copy forwarded by HOD shall be sent to the University once in every 3 months.

11. RECORD NOTE / LOG BOOK:
Record shall be maintained and assessed periodically by faculty and HOD. Institution shall provide adequate number of cases/teaching materials as specified in Dental Council of India regulation for the students during clinical / practical training and examinations.

12. TEXT BOOKS:
TEXT BOOKS RECOMMENDED
NAME OF THE BOOKS, AUTHOR, PUBLISHER
Sturdevant's Art and Science of Operative Dentistry, ELSEVIER
Pre - Clinical Manual of Conservative Dentistry, Dr.V.Gopikrishna, ELSEVIER

8. PRE CLINICAL PROSTHODONTICS &CROWN & BRIDGE

1. GOAL

The dental graduates during training in the institutions should acquire adequate knowledge, necessary skills and reasonable attitudes which are required for carrying out all activities appropriate to general dental practice involving prevention, diagnosis and treatment of anomalies and diseases of the teeth, mouth, jaws and associated tissues. The graduate also should understand the concept of community oral health education and be able to participate in the rural health care delivery programmes existing in the country.

2. OBJECTIVES

a. KNOWLEDGE

i) Adequate knowledge of the scientific foundations on which dentistry is based and good understanding of various relevant scientific methods, principles of biological functions, ability to evaluate and analyse scientifically various established facts and deals.

ii)Adequate knowledge of the development, structure and function of the teeth, mouth and jaws and associated tissues both in health and disease and their relationship and effect on general state of health and also bearing on physical and social well being of the patient.

iii)Adequate knowledge of clinical disciplines and methods which provide a coherent picture of anomalies, lesions and diseases of the teeth, mouth and jaws and preventive diagnostic and therapeutic aspects of dentistry.

iv)Adequate clinical experience required for the general dental practice.

v)Adequate knowledge of the constitution, biological functions and behaviour of persons in health and sickness as well as the influence of the natural and social environment on the state of health in so far as it affect dentistry.

b. ATTITUDE

A graduate should develop during the training period the following attitudes.

i. Willingness to apply the current knowledge of dentistry in the best interest of the patient and community.
ii. Maintain a high standard of professional ethics and conduct and apply these in all aspects of professional life.
iii. Seek to improve awareness and provide possible solutions for oral health problems and needs throughout the community.
iv. Willingness to participate in the CPED programmes to update knowledge and professional skill time to time.
v. Help and participate in the implementation of the national oral health policy.

c. SKILLS

A graduate should be able to demonstrate the following skills necessary fro practice in dentistry.

i. Diagnose and mange various common dental problems encountered in general dental practice keeping in mind the expectations and the right of the society to receive the best possible treatment available wherever possible.
ii. Prevent and manage complications if encountered while carrying out various surgical and other procedures.
iii. Carry out certain investigative procedures and ability to interpret laboratory findings.
iv. Promote oral health and help prevent oral disease where possible.
v. Control pain and anxiety among the patients during dental treatment.

d. INTEGRATION

Integrated knowledge about all the divisions in Prosthodontics (CD,RPD,FPD,IMPLANTS etc)

e. KNOWLEDGE ABOUT INFECTION AND CROSS INFECTION IN DENTISTRY

Knowledge about asepsis – disinfection and sterilization of instruments, clinical area / personal care as per universal protection, and disposal of medical wastes in the appropriate modes. Students should be aware of the rules and regulations pertaining to maintenance of clinical set up and waste disposal.

f. COMPUTER PROFICIENCY

Basic knowledge of Computers, MS Office, Window 2000, Statistical Programmes. Basic operative skills in analysis of data and knowledge of multimedia. Students should utilize a combination of traditional classroom courses, and online courses. The following validation is required and must be completed.

i. Technological Requirements for all Graduate Students
ii. A laptop or desktop computer that supports the following requirements
    a. Operating system requirements
    b. Internet browser requirements
    c. Reliable and consistent access to the internet
    d. Antivirus software which is current and consistently updated
    e. Microsoft Office
    f. Adobe Reader (or equivalent to view PDF files)

3. **COMPETENCIES**

1. General skills
2. Practice Management
3. Communication and Community Resources
4. Patient Care – Diagnosis
5. Patient Care - Treatment Planning
6. Competencies Specific to the Subject

4. **TEACHING HOURS**

During Ist Year BDS - 100 Practical hours
During II nd year BDS

Lecture	25 hours
Practical	200 hours
Total	225 hours

5. TEACHING METHODOLOGY

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
f) Integrated Teaching
g) Symposium and continuing medical education programmes and Computer Aided Study

6. **THEORY**

I. Introduction to Prosthodontics - Scope and Definition

A. Masticatory apparatus and function:

1. Maxillae & Mandible with & without teeth.
2. Muscles of mastication and accessory muscles of mastication.
3. Brief anatomy of TMJ.
4. Mandibular movements.
5. Functions of teeth.

B. Various branches of Prosthodontics and prosthesis:

1. Scope & limitation.
2. Appliances v/s prosthesis.
3. Dental prosthesis v/s non-dental prosthesis.

C. Effect of loss of teeth:

1. On general health.
2. On masticatory apparatus.
3. Need of replace lost teeth.

D. Outline of Prosthodontics:

1. Types of Prosthesis.
2. Requirements of prosthesis- Physical, biological, esthetic considerations.

II. Introduction to components of Prosthesis

A. Complete Denture Prosthesis:

1. Various surfaces (Border and surface anatomy).
2. Components - Base and Teeth.

B. Removable Patial Denture:

1. Classification.
2. Major and minor Connectors.
3. Direct retainers.
4. Rests.
5. Indirect retainers.
6. Denture base.
7. Artificial teeth.

C. Fixed Partial Denture:

1. Classification.
2. Retainers.
3. Pontics.
4. Connectors.

III. All related definitions and terminologies from glossary

1. Model
2. Cast
3. Impression
4. Occlusion rim
5. Temporary denture base
6. Permanent denture base
7. Occlusion
8. Face Bow & Articulator
9. Jaw relation - orientation, vetical and centric
10. Christensten's phenomenon
11. Key of occlusion
12. Balanced occlusion
13. Abutment etc…

IV. Introduction to mouth preparation - in brief

A. Complete Dentures

1. General considerations
2. Pre-prosthetic surgery

B. Removable partial dentres

1. General considerations
2. Occlusal rest preparation
3. Modifying conours of the abutments
4. Guide planes
5. Elimination of undercuts

C. Fixed Partial Dentures

1. Principles of tooth preparation - in brief
2. Retainers in brief

V. Introduction to all steps involved in fabrication of Prosthesis

Clinical Steps in brief and laboratory steps in detail

A. Impression Making

1. Definition and requirements and types of impressions
2. Various materials used for different impressions
3. Different theories of impression making

B. Impression Trays

1. Definition, classification, materials, advantages and disadvantages
2. Selection of trays
3. Special trays
4. Spacer design

C. Introduction to jaw relation record

1. Definition and type
2. Temporary denture base - Indications, Advantages, Disadvantages,materials used
3. Occlusion rims - materials, shape, dimensions
4. Clinical procedures of jaw relation recording in brief

D. Articulators and Face bow

1. Basic out line
2. Need for articulators
3. Definition, classification, parts, advantages, disadvantages of articulators
4. Definitions, classification, parts, advantages, disadvantages and purpose of face bow transfer
5. Demonstration of face bow transfer to an articulator on a dummy

E. Selection of Teeth

1. Various guidelines for selection of teeth including dentogenic concept
2. Arrangement of teeth in detail with various factors of esthetics, overjet, overbite etc

F. Occlusion

1. Balanced Occlusion - need and advantages
2. Various factors of balanced occlusion

G. Try in Procedures

1. Anterior try - in
2. Posterior try - in
3. Waxing, carving, polishing and final try - in

H. ProcessingProcedures

1. Flasking
2. Dewaxing
3. Packing
4. Curing
5. Finishing and polishing of acrylic dentures

VI.Casting Procedures

1. Preparation of die
2. Wax pattern
3. Investing
4. Burnout
5. Casting
6. Finishing and polishing

Bioethics

Bioethics is the application of ethics to the field of medicine and healthcare. Bioethics includes medical ethics, which focuses on issues in health care; research ethics, which focuses issues in the conduct of research; environmental ethics, which focuses on issues pertaining to the relationship between human activities and the environment, and public health ethics.

7. PRACTICAL EXCERCISES

1. Preparation of special trays
2. Preparation of temporary and permanent denture bases
3. Preparation of occlusion rims
4. Orientation of occlusion rims on articulator
5. Arrangement of teeth
6. Processing of complete dentures

1. Arrangement of teeth - Must Know
2. Surveying of partially edentulous models and preparing modified master cast - Desirable to Know
3. Preparing of was patterns spruing, casting and finishing (in batches of students not more than 8)
- Desirable to Know
4. Preparation of plaster models of various preparation of teeth to receive retainers for FPD
- Desirable to Know

5. Prepare wax patterns for minimum of 3 unit FPD and investing, casting and porcelain facing (for Batch of 8 students) - Desirable to Know

Note:

1. Students shall submit one processed denture mounted on an articulator to present on university practical exam along with record book.
2. Exercises of RPD and FPD to be submitted in groups along with the record book

8. Theory Examination

No Theory Examination

9. Practical Examination:

A. Practical Exercise: (Duration-3 hrs) : 60 Marks

Arrangement of teeth in class I relation, Waxing, Carving, Polishing

B. Viva-Voce 20 Marks

C. Internal Assessment 20 Marks

10. FORMATIVE/INTERNAL ASSESSMENT:

The continuing assessment examination held at least 3times in a particular year and best of two examinations shall be considered. The Internal Assessment marks to be submitted to the university, once in every three months. The marks scored by the students shall be displayed on the Notice board and a copy forwarded by HOD shall be sent to the University once in every 3 months.

11. **RECORD / LOG BOOK**:

Record shall be maintained and assessed periodically by faculty and HOD. Institution shall provide adequate teaching number of cases/teaching materials as specified in Dental Council of India regulation for the students during clinical/practical training and examinations.

12. TEXT BOOKS

1. Essential of Complete Denture Prosthodontics - Winkler
2. Prosthodontic Treatment for Edentluous Patients - Zarb Bolender
3. Clinical Removable Partial Denture - Stewart
4. Fundamentals of Fixed Prosthodontics - Shillingburg
5. Text Book of Prosthodontics - Deepak Nallaswam

13. REFERENCE BOOKS

1. Impression Techniques for Complete Denture - Bernard Levin
2. Removable Partial Prosthodontics - Mc Cracken
3. Contemporary Fixed Partial Denture - Rosenstiel
4. Syllabus of Complete denture by – Charles M. Heartwell Jr. and Arthur O. Rahn.
5. Boucher's "Prosthodontic treatment for edentulous patients"
6. Essentials of complete denture prosthodontics by – Sheldon Winkler
7. Maxillofacial prosthetics by – Willam R. Laney
8. McCraken"s Removable partial prosthodontics
9. Removable partial Prosthdontics by – Ernest L.Miller and Joseph E. Grasso.

9. GENERAL MEDICINE

1. GOAL

The broad goal of the teaching of undergraduate BDS students in General Medicine aims at providing comprehensive knowledge of the both the normal physiology as well as the abnormal pathology to provide a basis for understanding the clinical manifestations in the various disease presentations

2. OBJECTIVES

a. KNOWLEDGE and UNDERSTANDING:

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

i. Describe the etiology, pathogenesis, clinical signs and symptoms and complications of various disease processes
ii. Know of the various pre-requisite settings for the various diseases to occur including a knowledge of the various co-morbidities especially lifestyle diseases such as Hypertension, Diabetes Mellitus.
iii. Awareness of the oral manifestations of various systemic disorders
iv. Knowledge of the medical conditions requiring screening and evaluation prior to dental procedures
v. To be aware of BLS steps in cases of medical emergencies while undergoing dental procedures

b. SKILLS:

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

i. Take a proper history from the patient
ii. Do a complete general physical examination including build and nourishment
iii. Assess the vitals-recording the details of Pulse, recording the BP, temperature, checking capillary blood glucose and oxygen saturation
iv. Look for cyanosis, clubbing, pallor, icterus, pedal edema, lymphadenopathy, rashes, ecchymosis
v. Able to examine the CVS, RS, abdomen and the facial nerve
vi. Interpret the elicited signs and symptoms of various systemic disease processes
vii. Interpreting lab reports such as importance of CBC, RFT, ECG, BT, CT, PT, INRetc
viii. To be trained in simple procedures such as giving intramuscular, intravenous Injection as well as staring an IV line
ix. To be trained in basic life support

x. Writing prescriptions

c. ATTITUDE:

i. Willingness to apply the current knowledge of dentistry in the best interest of the patient and community
ii. Seek to improve awareness and provide possible solutions for oral health problems and needs throughout the community

d. INTEGRATION:

From the integrated teaching of other clinical sciences, the student shall be able to describe the various signs and symptoms and interpret the clinical manifestation of disease processes.Horizontal integration can be done in common with basic science departments, and vertical integration can be done with clinical departments. For example, horizontal integration can be the interpretation of lab results with Biochemistry and biopsy reports with Pathology; and vertical integration can be the study of oropharyngeal pathology of along with ENT and oral surgical procedures with General surgery

e. KNOWLEDGE ABOUT INFECTION AND CROSS INFECTION IN DENTISTRY

Knowledge about asepsis – disinfection and sterilization of instruments, clinical area/personal care as per universal protection, and disposal of medical wastes in the appropriate modes. Students should be aware of the rules and regulations pertaining to maintenance of clinical set up and waste disposal.

f. COMPUTER PROFICIENCY:

Basic knowledge of Computers, MS Office, Window 2000, StatisticalProgrammes Basic operative skills in analysis of data and knowledge of multimedia. Students should utilize a combination of traditional classroom courses, and online courses. The following validation is required and must be completed.

i. Technological Requirements for all Graduate Students
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    a) Operating system requirements
    b) Internet browser requirements

c) Reliable and consistent access to the internet
d) Antivirus software which is current and consistently updated
e) Microsoft Office
f) Adobe Reader (or equivalent to view PDF files)

3. **COMPETENCIES**

1. General skills
2. Practice Management
3. Communication and Community Resources
4. Patient Care – Diagnosis
5. Patient Care - Treatment Planning
6. Competencies specific to the subject

4. TEACHING HOURS

Lecture Hours	- 60 hrs
Practical Hours	- 90 hrs
Total	- 150 hrs

5.TEACHING METHODOLOGY

Theory (Teaching-Learning methods)

- Didactic Lecture- with a problem solving approach, with discussions of relevant clinical problems.
- Interactive Lecture (include buzz groups, self-assessment questions, quizzes, MCQs, One minute paper)
- Seminar
- Symposium

- Role play and discussion on medical ethics topics
- Self-directed learning

6. **THEORY SYLLABUS**

TOPIC	MUST KNOW	DESIRABLE TO KNOW	NICE TO KNOW
Aim Of Medicine	Know about signs symptoms Diagnosis, differential diagnosis investigation treatment and prognosis		
Infections	Mumps, measles Herpes zoster/ varicella Herpes Simples HIV/AIDS Oral Hairy lecoplakia Hand, foot and mouth disease Swine flu	rubella EBV infections— Infectious mononucleosis Nasopharyngeal Ca	chikungunya Yellow fever
	Syphilis Diphtheria Enteric fever Leptospirosis	Sepsis	PUO
	Hansen's disease Tuberculosis		
	Dengue Malaria	Amoebiasis Filariasis	
	Candidiasis	Mucormycosis	
Vitamin & micronutrient Deficiencies	B1,B2, B3, B6,B12 Vitamin C and D Fluoride Zinc Iron	Vitamin K Selenium Chromium	Balanced diet PEM
Endocrine	Diabetes Melltus Acromegaly Calcium metabolism and Parathyroid Addison's disease Cushing's disease Hypothyroidism Hyperthyroidism		
CVS	Acute Rheumatic fever Rheumatic valvular heart disease Infective Endocarditis Hypertension Ischemic heart disease Common Arrhythmias	Bronchiectesis Lung abscess Pleural effusion Pneumothorax Bronchogenic Ca	

	Congestive cardiac failure		
RS	COPD Broncial asthma Pulmonary TB Pneumonia		
Renal system	Acute renal failure Chronic Renal failure Nephritis Nephrotis syndrome	Diarrhoea Dysentery Amoebiaisis Malabsorption	
GIT	Stomatitis Gingival hyperplasia Dysphagia Acid peptic Disease GERD Jaundice Acute hepatitis Chronic Hepatitis Cirrhosis of liver Ascites		
Haematology	Anaemias Bleeding and clotting disorders Leukemias and lymphomas Agranulocytosis Splenomegaly Generalized lymphadenopathy Oral manifestations of Haematological disorders	Meningitis	
CNS	Facial palsy Facial pain including trigeminal neuralgia Headache including migraine Epilepsy Lower cranial nerves	Acute pulmonary edema ARDS	Examination of comatose patient
Critical Care	Syncope Cardiac Arrest CPR Shock		

Bioethics

Bioethics is the application of ethics to the field of medicine and healthcare. Bioethics includes medical ethics, which focuses on issues in health care; research ethics, which focuses issues in the conduct of research; environmental ethics, which focuses on issues pertaining to the relationship between human activities and the environment and public health ethics.

7. PRACTICALS ----PROCEDURES/ CLINICAL DEMONSTRATIONS

1. System wise case presentation
2. Demonstration of clinical signs
3. Small group discussion of clinical manifestations, diagnosis, differential diagnosis, investigations and treatment

LIST OF DEMONSTRATIONS IN PRACTICALS

1. Demonstration of BLS
2. Confirming cardiac arrest
3. Checking carotid pulse
4. Manual Inline stabilization of cervical spine
5. Establishing airway patency during CPR
6. Applying chest compression in CPR

8. THEORY EXAMINATION (3 Hours)

Elaborate on : 2 x 10 = 20 Marks
Write notes on: 10 x 5 = 50 Marks

Total = 70 marks

9. PRACTICALS / CLINICAL EXAMINATION

Long case----1--------- 50 Marks
Short case-----1-------- 30 Marks
Spotter---------- 10 Marks

Total marks= 90 Marks

Long Case
--------Complete case sheet writing including
---------History Taking

---------General Examination
---------Examination of system involved as the case may be

- CVS
- RS
- Abdomen
- Facial nerve

Examination of other systems

----------Diagnosis / Differential Diagnosis
---------Investigations
---------Treatment

Short case-
-------Only General examination and examination of system involved
-----Discussion of case findings, diagnosis and treatment
-----No case sheet writing

List of spotters for practical examination--- For example---

Facial palsy -----Unilateral / bilateral facial palsy
Herpes Oral pigmentations of systemic diseases
Cervical Lymphadenopathy Cyanosis Clubbing / koilonychia
Pallor Icterus

Examination to include in VIVA
Questions in various systems including
Instruments---use for systemic evaluation and procedures-- For example

1. BP apparatus
2. IV cannula
3. Pulse oximeter
4. Thermometer
5. Glucometer
6. Ryle tube

7. Urinary catheter
8. AMBU bag
9. Endotracheal tube
10. Lab reports --- CBC, BT, CT, PT, aPTT, INR

List of Xrays including---

Normal Chest Xray
Xrays of CVS like cardiomegaly
Xrays of RS like that of COPD

Drugs & medications used in various medical emergencies in the dental procedures for example

1. Management of hypotension with IV saline
2. Management of cardiogenic shock with Inj Adrenaline &Inj Atropine
3. Management of seizures with Inj Diazepam / Inj Phenytoin
4. Inj Soda bicarb
5. Inj Hydrocotisone
6. Management of pulmonary edema with Inj Morphine / Inj Furosemide
7. Management of hypocalcemia with Inj Calcium gluconate
8. Managment of bleeding with Inj Vit K /Inj Adrenochrome
9. Management of hypoglycemia with Inj 25 % dextrose
10. Management of asthma with bronchodilators

Viva marks= 20Marks

	Examination	Internal Assessment	Viva	Total
Theory	70	10	20	100
Practicals	90	10	-	100
Total				200

10. FORMATIVE / INTERNAL ASSESSMENT

The continuing assessment examination (both Theory/Practical) held at least 3times in a particular year and best of two examinations should be considered. The Internal Assessment marks to be submitted to the University, once in every three months. The marks scored by the students shall be displayed on the Notice board, a copy forwarded by HOD shall be sent to the University once in every 3months.

Theory IA = 10 marks
Practical IA = 10 marks

Total 20 marks
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11. RECORD NOTE / LOG BOOK

Record shall be maintained and assessed periodically by faculty and HOD. Institution shall provide adequate number of cases/teaching materials as specified in Dental Council of India regulation for the students during clinical/practical training and examinations.

12. TEXT BOOKS

i. Davidson's Principle and Practice of Medicine
ii. Hutchison's clinical methods

10. GENERAL SURGERY

1. GOAL

The students should gain the knowledge and insight into the basic surgical principles, common surgical conditions of Head & Neck and its management.

2. OBJECTIVES

KNOWLEDGE AND UNDERSTANDING

At the end of the third BDS in General surgery the undergraduate student is expected to

1. Know the surgical anatomy , physiology and pathological basis of diseases of head and neck
2. Know the basic surgical principles
3. Know the common surgical conditions of Head & Neck
4. Know eliciting History and to do Clinical examination and to arrive at a Provisional diagnosis
5. Know about Radiological and blood investigations to arrive at a diagnosis

SKILLS

1. Know the interpretation of Radiological films of Head and Neck
2. Know the Operative procedures, Post operative complications and Post operative management
3. To differentiate between Benign and Malignant diseases of Head & Neck
4. Know to perform minor surgical procedures such as Draining an Abscess and taking a Biopsy

ATTITUDE

1. Willingness to apply the current knowledge of dentistry in the best interest of the patient and community
2. Seek to improve awareness and provide possible solutions for oral health problems and needs throughout the community

INTEGRATION

By emphasizing on the relevant information and sound knowledge of Basic Science, to acquaint the student with various diseases, which may require surgical expertise and to train the student to analyse the history and be able to do a thorough clinical examination of the patient.

This insight is gained in a variety of ways:

1. Lectures and small group teachings
2. Clinical Demonstrations
3. Observing Surgical procedures in theatres
4. Charts and models for Common surgical conditions

KNOWLEDGE ABOUT INFECTION AND CROSS INFECTION IN DENTISTRY

Knowledge about asepsis – disinfection and sterilization of instruments, clinical area/ personal care as per Universal protection, and disposal of medical wastes in the appropriate modes. Students should be aware of the rules and regulations pertaining to maintenance of clinical set up and waste disposal.

COMPUTER PROFICIENCY

Basic knowledge of Computers, MS Office, Window 2000, Statistical Programmes, Basic operative skills in analysis of data and knowledge of multimedia. Students should utilize a combination of traditional classroom courses, and online courses. The following validation is required and must be completed.

1. Technological Requirements for all Graduate Students
2. A laptop or desktop computer that supports the following requirements
    - Operating system requirements
    - Internet browser requirements
    - Reliable and consistent access to the internet
    - Antivirus software which is current and consistently updated
    - Microsoft Office
    - Adobe Reader (or equivalent to view PDF files)

3. **COMPETENCIES**

1. General skills
2. Practice Management
3. Communication and Community Resources
4. Patient Care – Diagnosis
5. Patient Care - Treatment Planning
6. Competencies specific to the subject

4. TEACHING HOURS

Lecture Hours -60 hrs
Practical Hours -90hrs
Total-150 hrs

5. TEACHING METHODOLOGY

- Combination of Lectures
- Small group seminars, tutorials
- Observing treatment in out patient department and in General wards
- Observing Operative procedures in theatres
- Audio visual aids

6. THEORY SYLLABUS INCLUDING BIOETHICS, DENTAL JURISPRUDENCE
THEORY SYLLABUS

TOPIC	MUST KNOW	DESIRABLE TO KNOW	NICE TO KNOW
		History of surgery	
	General Principles of Surgery		
Wounds	Classification, types, healing, Repair, Treatment	Medicolegal aspect and Complications	
Inflammation	Acute and chronic infections of soft tissues, causative organisms and complications & treatment Transmissable viral infections		
Shock & hemorrhage	Definition, Classification, causes Clinical features and Management	Blood groups, Transfusion, blood products	Hemophilias
Tumours Ulcers Cysts	Classification, Clinical examination, treatment		

Sinus Fistulae			
Diseases of lymphatic System	TB, Secondaries	Lymphoma	Leukemia
Diseases of Oral Cavity	Infections, Premalignant malignant diseases of oral cavity, Salivary gland		
Diseases of larynx & Nasopharynx		Infective and malignant diseases	
Trachea	Tracheostomy		
Nervous system	Facial nerve, Trigeminal neuralgia	Principles of peripheral nerve injuries, regeneration, treatment	
Fractures	Mandible, Le Fort fracture	General principles of fractures, clinical presentation and treatment	Newer methods
Principles of operative surgery	Minor surgical procedures	Asepsis, Antiseptics	Sterlisation
		Principles of anaesthesia Principles of tissue replacement	Sutures, Drains, Diathermy Laser
Anomalies of Development of Face	Cleft lip and cleft palate		
Thyroid and Parathyroid	Thyroid disorders Malignancy	Parathyroid Disorders	
Jaw Swellings	Differential diagnosis and management		
Biopsy	Different types of biopsies		

Bioethics

Bioethics is the application of ethics to the field of medicine and healthcare. Bioethics includes medical ethics, which focuses on issues in health care; research ethics, which focuses issues in the conduct of research; environmental ethics, which focuses on issues pertaining to the relationship between human activities and the environment, and public health ethics.

7. CLINICAL HOURS

- Clinical demonstration in OPD – 40 Hours
- Bedside clinics – 35 Hours
- Operation Theatre observation – 10 Hours
- Demonstration of emergency trauma care – 5 Hours

Total - 90 Hours

8. THEORY EXAMINATION: (3 Hours)

Elaborate on: 2 x10= 20 Marks
Write notes on: 10x5 = 50 Marks

Total marks 70 Marks

The questions should cover different topics of General surgery

9. PRACTICAL EXAMINATION

Long case: one case : 1 x 50 marks = 50 marks
Short case: one case: 1 x 30 marks = 30 marks
OSCE : two stations : 2 x 5 marks = 10 marks

Total : 90 Marks

Criteria to be followed during General Surgery practical examination:
Duration of Long Case : 45 minutes
Candidate should write Case sheet with Provisional Diagnosis, Investigations and Treatment
Duration of Short case: 15 minutes
Only Physical Examination of patient is sufficient
OSCE duration – Each station 3 minutes

VIVA VOCE -20 MARKS

Instruments – 10 marks
X rays and Specimen – 10 marks

	Examination	Internal Assessment	Viva	Total
Theory	70	10	20	100
Practicals	90	10	-	100
Total				200

10. FORMATIVE/INTERNAL ASSESSMENT

The continuing assessment examination (both Theory/Practical) held at least 3times in a particular year and best of two examinations should be considered. The Internal Assessment marks to be submitted to the University, once in every three months. The marks scored by the students shall be displayed on the Notice board and a copy forwarded by HOD shall be sent to the University once in every 3 months.

Total – 20 Marks
Theory IA - 10 Marks.
Practical IA -10 Marks.

Topics for each assessment:

I. History of Surgery, General Principles of Surgery, Wounds, Inflammation, Infections, Transmissible viral infections:
II. Shock & Hemorrhage, Tumours, Ulcers, Cysts, Sinus and Fistulae, Diseases of lymphatic system, Diseases of oral cavity, Diseases of larynx, Nasopharynx

III. Nervous system, Fractures, Principles of operative surgery, Anomalies of Development of Face, Diseases of Thyroid and Parathyroid, Swellings of Jaw, Biopsy

11. RECORD NOTE / LOG BOOK

Record shall be maintained and assessed periodically by faculty and HOD. Institution shall provide adequate number of cases as specified in Dental Council of India regulation for the students during clinical training and examinations.

12. TEXT BOOKS:

i. Bailey and Love 26th Edition
ii. Das Clinical Surgery
iii. Short Cases surgery Das

12. ORAL MEDICINE AND RADIOLOGY

1. GOAL

The dental graduates during training in the institutions should acquire 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 and Radiological skills. 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.

2. OBJECTIVES

a. Knowledge and Understanding :

i. Adequate knowledge of the scientific foundations on which dentistry is based and good understanding of various relevant scientific methods, principles of biological functions and should be able to evaluate and analyse scientifically various established facts and data.
ii. Adequate knowledge of the development, structure and function of the teeth, mouth and jaws and associated tissues both in health and disease and their relationship and effect on general-state of health and also the bearing on physical and social well-being of the patient.
iii. Adequate knowledge of clinical disciplines and methods, which provide a coherent picture of anomalies, lesions and diseases of the teeth, mouth and jaws and preventive, diagnostic and therapeutic aspects of dentistry.
iv. Adequate clinical experience required for general dental practice
v. Adequate knowledge of biological function and behaviour of persons in health and sickness as well as the influence of the natural and social environment on the state of health so far as it affects dentistry.

b. Skills :

i. 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 possible treatment available wherever possible.
ii. Acquire skill to prevent and manage complications if encountered while carrying out various dental surgical and other procedures.

iii. Possess skill to carry out required investigative procedures including clinical and radiological investigations and ability to interpret laboratory findings.
iv. Promote oral health and help to prevent oral diseases wherever possible.
v. Accurate planning of treatment
vi. Competent in control of pain and anxiety during dental treatment.

c. Attitude:

A graduate should develop during the training period the following attitudes.
i. Willing to apply current knowledge of dentistry in the best interest of the patients and the community.
ii. Maintain a high standard of professional ethics and conduct and apply these in all aspects of professional life.
iii. Seek to improve awareness and provide possible solutions for oral health problems and needs throughout the community.
iv. Willingness to participate in the continuing education programmes to update knowledge and professional skills from time to time.
v. To help and to participate in the implementation of national health programmes.

d. Integration:

From the integrated teaching, the student shall be able to describe the various signs and symptoms and interpret the clinical manifestation of disease processes.
Horizontal integration can be done in common with basic science departments, and vertical integration can be done with clinical departments.

e. Knowledge about infection and cross infection in dentistry:

Knowledge about asepsis – disinfection and sterilization of instruments, clinical area/ personal care as per universal protection, and disposal of medical wastes in the appropriate modes. Students should be aware of the rules and regulations pertaining to maintenance of clinical set up and waste disposal.

f. Computer Proficiency:

Basic knowledge of Computers, MS Office, Window 2000, Statistical Programmes. Basic operative skills in analysis of data and knowledge of multimedia. Students should utilize a combination of traditional classroom courses, and online courses. The following validation is required and must be completed.

i. Technological Requirements for all Graduate Students
ii. A laptop or desktop computer that supports the following requirements
    a. Operating system requirements
    b. Internet browser requirements
    c. Reliable and consistent access to the internet
    d. Antivirus software which is current and consistently updated
    e. Microsoft Office
    f. Adobe Reader (or equivalent to view PDF files)

3. **COMPETENCIES**

1. General skills
2. Practice Management
3. Communication and Community Resources
4. Patient Care – Diagnosis
5. Patient Care - Treatment Planning
6. Competencies specific to the subject

- Should be able to Identify precancerous and cancerous lesions of the oral cavity and refer to the concerned speciality for their management
- Should have an adequate knowledge about common laboratory investigation and Interpretation of their results.
- Should have adequate knowledge about medical complications that can arise while treating systemically compromised patients and take prior precautions, consent from the concerned medical specialists.
- Have adequate knowledge about radiation health hazards, radiation safety and protection.
- 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 radiograph in forensic identification and age estimation

- Should be familiar with jurisprudence, ethical and understand the significance or dental records with respect to law

4. **TEACHING HOURS**

MINIMUM WORKING HOURSE FOR SUBJECT OF STUDY

Subject	Lecture Hours	Clinical Hours	Total Hours
Oral Medicine and Radiology	65	170	235

Minimum Working Hours- 3rd BDS

Subject	Lecture Hours	Clinical Hours	Total Hours
Oral Medicine and Radiology	20	70	90

Minimum Working Hours- 4th BDS

Subject	Lecture Hours	Clinical Hours	Total Hours
Oral Medicine and Radiology	45	100	145

Forensic Odontology shall be covered in the department of Oral Pathology and Oral Medicine during 3rd Year BDS and Final BDS Respectively

5. **TEACHING METHODOLOGY**

Interactive and Group teaching, Demonstrations and Teaching with LCD (Advanced audiovisual System), microphone and facilities for slide, overhead and multi-media projection

The objectives of teaching Oral Medicine and Radiology 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
f) Integrated Teaching
g) Symposium and continuing medical education programmes.

6. **THEORY SYLLABUS**

III BDS ORAL MEDICINE AND RADIOLOGY
PRACTICALS: 70 HOURS THEORY: 20 HOURS
III YEAR ORAL MEDICINE THEORY
SYSTEMIC PHARMACOLOGY

TOPIC	MUST KNOW	DESIRABLE TO KNOW	NICE TO KNOW
Oral medicine and diagnostic aids 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 (3) Investigations (a) Biopsy and exfoliative cytology (b) Hematological, Microbiological and other tests and investigations necessary for diagnosis and prognosis		

Diagnosis, Differential Diagnosis	(1) Teeth: Developmental abnormalities, causes of destruction of teeth and their sequelae and discoloration of teeth (2) Inflamation - Injury, infection and spread of infection, fascial space infections, osteoradionecrosis. (3) Temparomandibular joint: Developmental abnormalities of the condyle. Rheumatoid arthritis, Osteoarthritis, Subluxation and luxation. (4) Periodontal diseases: Gingival hyperplasia, gingivitis, periodontitis, pyogenic granuloma (5) Common cysts and Tumors:		
Common cysts and Tumors: (I)CYSTS:	• Cysts of soft tissue: Mucocele and Ranula • Cysts of bone: Odontogenic and nonodontogenic.		
(II)TUMORS:	Soft Tissue: • Epithelial: Papilloma, Carcinoma, Melanoma • Connective tissue: Fibroma, Lipoma, Fibrosarcoma • Vascular·: Haemangiorna, Lymphangioma • Nerve Tissue: Neurofibroma, Traumatic Neuroma, Neurofibromatosis • Salivary Glands: Pleomorphic adenoma, Adenocarcinoma, Warthin's Tumor, Adenoid cystic carcinoma.		
Teeth	Developmental abnormalities, causes of destruction of teeth and their sequelae and discoloration of teeth		
Inflamation	Injury, infection and sperad of infection, fascial space infections, osteoradionecrosis.		
Temparomandibular joint	Developmental abnormalities of the condyle. Rheumatoid arthritis, Osteoarthritis, Subluxation and luxation.		

Periodontal diseases	Gingival hyperplasia, gingivitis, periodontitis, pyogenic granuloma		
Common cysts and Tumors: CYSTS:	Cysts of soft tissue: Mucocele and Ranula Cysts of bone: Odontogenic and nonodontogenic.		
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		
Oral medicines and therapeutics 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		
Important common mucosal lesions	• White lesions: Chemical burns, leukodema, leukoplakia, fordyce spots, stomatitis nicotina palatinus, white sponge nevus,		

	candidiasis, lichen planus, 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. • Cervico-facial lymphadenopathy		
Facial pain: 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., 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.)		
Oral manifestations of: (i) Metabolic disorders:	a) Porphyria (b) Haemochromatosis (c) Histocytosis X diseases		
(ii) Endocrine disorders:	(a) Pituitary: Gigantism, acromegaly, hypopitutarism (b) Adrenal cortex: Addison's disease (Hypofunction) 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 Deficiency 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		
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		
Dermatological diseases with oral manifestations:	(a)Ectodermal dysplasia (b)Hyperkerotosis palmarplantaris with periodontopathy (c)Scleroderma (d)Lichen planus including ginspan's syndrome (e)Lupus erythematosus		

	(f)Pemphigus (g)Erythema multiforme (h)Psoriasis (8) 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		
Allergy:	Local allergic reactions, anaphylaxis, serum sickness (local and systemic allergic manifestations to food drugs and chemicals)		
Foci of oral infection and their ill effects on general health			
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.		
	Precancerous lesions and conditions		
	Neuralgic pain due to unknown causes: Trigeminal neuralgia		
	Myofacial Pain Dysfunction Syndrome (MPDS), Bell's		

	palsy		
Diseases of bone and Osteodystrophies:		• Development disorders: Anomalies, Exostosis and tori, infantile cortical hyperostosis, osteogenisis imperfecta, Marfans syndrome, osteopetrosis. Metabolic disorders – Histiocytosis • Endocrine – Acro-megaly and hyperparathyroidism Miscellaneous – Paget's disease, Mono and polyostotic fibrous dysplasia, Cherubism. • Granulomatous diseases: Tuberculosis, Sarcoidosis, Midline lethal granuloma, Crohn's Disease and Histiocytosis X • Miscellaneous Disorders: Burkitt lymphoma, sturge – Weber syndrome, CREST syndrome, renduosler-weber disease	
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:, glossopharyngeal neuralgia, sphenopalatine ganglion neuralgia, periodic migrainous neuralgia and atypical facial pain (c) Referred pain: Pain arising from distant tissues like heart, spine etc (d) Altered sensations: paresthesia, halitosis	

Nerve and muscle diseases:		(i) Nerves: (a) Neuropraxia (b) Neurotemesis (c) Neuritis (d) Facial nerve paralysis including 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	
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	
Recent advancements in Field of Oral Medicine and Oral Diagnosis Clinical significance of laboratory values Forensic examination			Procedures for post-mortem dental examination; maintaining dental records and their use in dental practice and post-mortem identification; jurisprudence and ethics 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
ORAL RADIOLOGY Scope of the subject and history of origin			
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		
Biological effects of radiation			
Radiation safety and protection measures			
Principles of image production			
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		
Factors in production of good radiographs:	(a) K.V.P. and mAs of X-ray machine (b) Filters (c) Collimations (d) Intensifying screens (e) Grids (f) Xray films (g) Exposure time (h) Techniques (i) Dark room (j) Developer and fixer solutions (k) Film processing		
Radiographic normal anatomical landmarks			
Faculty radiographs and artefacts in radiographs			
Interpretation of radiographs in various abnormalities of teeth, bones and other orofacial tissue.			
		Principles of radiotherapy of orofacial malignancies and complications of radiotherapy Contrast radiography and basic knowledge of radio-active isotopes	
Radiography in			Radiographic

Forensic Odontology			age estimation and post-mortem radiographic methods Recent advancements in Field of Oral and Maxillofacial Radiology

Bioethics

Bioethics is the application of ethics to the field of medicine and healthcare. Bioethics includes medical ethics, which focuses on issues in health care; research ethics, which focuses issues in the conduct of research; environmental ethics, which focuses on issues pertaining to the relationship between human activities and the environment, and public health ethics.

7. **PRACTICALS/ CLINICS**

Orientation Postings in Oral Medicine and Radiology
Introduction to clinical armamentarium
Demonstration of Patient registration
Orientation and visit to paramedical departments like Laboratory and Pharmacy
Writing of case sheets
Methods of arriving at Diagnosis
Treatment planing
Follow up
Demonstration of Intraoral, extraoral and Digital radiography
Training in Radiation protection methods
Interpretation of Pathology

Student should undergo Basic Life Support and Biomedical waste management training

8. **THEORY EXAMINATION (3 Hours)**

Elaborate on 2 X 10 = 20 marks
Write Notes on 10X 5 = 50 marks
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70 marks
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9. **PRACTICAL / CLINICAL EXAMINATIONS**

I. Clinicals in Oral Medicine: 60 Marks (recording of Long Case)
   a. Case History taking : 30 Marks
   b. Diagnosis & Differential Diagnosis: 10 Marks
   c. Investigations : 10 Marks
   d. Management : 10 Marks

II. Clinicals in Radiology: 30 Marks (One Intra Oral Periapical Radiograph to be taken)
   a. Technique: 10 Marks
   b. Processing: 10 Marks
   c. Interpretation: 10 Marks

Viva 20 Marks

	Examination	Internal Assessment	Viva	Total
Theory	70	10	20	100
Practicals	90	10	-	100
Total				200

10. FORMATIVE/INTERNAL ASSESSMENT

The continuing assessment examination (both Theory/Practical) held at least 3times in a particular year and best of two examinations should be considered. The Internal Assessment marks to be submitted to the University, once in every three months. The marks scored by the students shall be displayed on the Notice board and a copy forwarded by HOD shall be sent to the University once in every 3 months of which shall be sent to the University once in every 3months after obtaining signature from the candidate and faculty and forwarded by HOD.

11. RECORD NOTE /LOG BOOK:

Record shall be maintained and assessed periodically by faculty and HOD. Institution shall provide adequate number of cases/teaching materials as specified in Dental Council of India regulation for the students during clinical/practical training and examinations.

12. TEXT BOOKS

1. Burket's Oral Medicine 12th Edition
2. Differential Diagnosis of Oral and Maxillofacial Lesions, 5e.(Norman K Wood , Paul W Goaz)
3. White and Pharoah, Oral Radiology Principles and Interpretation: First South Asia Edition
4. Essentials of Dental Radiography and Radiology, 4e. by Eric Whaites
5. Oral and Maxillolfacial Pathology: First South Asia Edition by Neville
6. Shafer's Textbook of Oral Pathology - 8th Edition

13. REFERENCE BOOKS

a) Oral Diagnosis, Oral Medicine & Oral Pathology

i. Burkit – Oral Medicine – J.B. Lippincott Company
ii. Principles of Oral Diagnosis, Coleman, Mosby Year Book
iii. Oral Manifestations of Systemic Diseases, Jones, W.B. Saunders company
iv. Oral Diagnosis & Oral Medicine, Mitchell
v. Oral Diagnosis, Kerr
vi. Oral Diagnosis & Treatment ,Miller
vii. Clinical Methods, Hutchinson

viii. Oral Pathology, Shafers
ix. Principles and practice of Oral Medicine, Sonis.S.T., Fazio.R.C. and Fang.L

b) Oral Radiology
i. Oral Radiology White & Goaz, Mosby year Book
ii. Dental Radiology, Weahrman,C.V. Mosby Company
iii. Oral Roentgenographs Diagnosis, Stafne ,W.B. Saunders Co
iv. Fundementals of Dental radiology, Sikri, CBS Publishing.

(c) Forensic Odontology
i. Practical Forensic Odontology, Derek H. Clark ,Butterworth-Heinemann
ii. Manual of Forensic Odontology, C Michael Bowers, Gary Bell

14. CRI POSTING SCHEDULE AND ORIENTATION

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 month
(Intra-oral)I.O. (Extra oral) E.O.	1
Cephalogram	1
4. Effective management of cases in wards	2 cases

Period of Postings
Oral Medicine & Radiology - 1 Month

18. ORAL AND MAXILLOFACIAL SURGERY

1**. GOAL**

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 into the in-patient management of maxillofacial problems.

2. **OBJECTIVES**

a. Knowledge and Understanding:

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

1. Apply the knowledge gained in the related medical subjects like pathology, Microbiology and general medicine in the management of patients with oral surgical problems
2. Diagnose, manage and treat (understand the principles of treatment) patients with oral surgical problems.
3. Gain Knowledge of a range of surgical treatments.
4. Be able 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 management of major oral surgical procedures and principles involved in patient management.
7. Know the ethical issues and have 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 LA 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. Understand the management of major oral surgical problems and principles involved, in inpatient management.

c. Attitude:

A graduate should develop during the training period the following attitudes

1. Willingness to apply the current knowledge of dentistry in the best interest of the patient and 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 CDE programmes to update knowledge and professional skill from time to time
5. Help and participate in the implementation of the national oral health policy.

d. Integration:

Horizontal integration - Provision of learning within the structure where individual departments/subject areas contribute to the development and delivery of learning in a meaningful, holistic manner. Links are made between the different subject areas and that learning is enriched by the connections and interrelationships being made explicit by this process.

Vertical integration - combination of basic and clinical sciences in such a way that the traditional divide between preclinical and clinical studies is broken down. Basic science is represented explicitly in the curriculum within the clinical environments during all the years of undergraduate education and beyond into postgraduate training and continuing professional development.

(e.g.) All the students studied a case of Oral cancer - the second-year student prepared the pathology part while the intern correlated it with the case presentation. This was followed by a first year explaining the anatomy and the final year explaining the signs, symptoms, grading and staging, The surgical part was correlated with anatomy by the postgraduate.

e. Knowledge about infection and cross infection in dentistry:

Knowledge about asepsis – disinfection and sterilization of instruments, clinical area/ personal care as per universal protection, and disposal of medical wastes in the appropriate modes. Students should be aware of the rulesand regulations pertaining to maintenance of clinical set up and waste disposal.

f. Computer Proficiency:

Basic knowledge of Computers, MS Office, Window 2000, Statistical Programmes. Basic operative skills in analysis of data and knowledge of multimedia. Students should utilize a combination of traditional classroom courses, and online courses. The following validation is required and must be completed.

i. Technological Requirements for all Graduate Students
ii. A laptop or desktop computer that supports the following requirements
    a. Operating system requirements
    b. Internet browser requirements
    c. Reliable and consistent access to the internet
    d. Antivirus software which is current and consistently updated
    e. Microsoft Office
    f. Adobe Reader (or equivalent to view PDF files)

3. **COMPETENCIES**

1. General skills
2. Practice Management
3. Communication and Community Resources
4. Patient Care – Diagnosis
5. Patient Care - Treatment Planning
6. Competencies specific to the subject

- Able to apply the knowledge gained in the basic medical and clinical subjects in the management of patients with surgical problems
- Able to diagnose, manage and treat patients with basic oral surgical problems
- Have a broad knowledge of maxillofacial surgery and oral implantology
- Should be familiar with legal, ethical and moral issues pertaining to the patient care and communication skill
- Should 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
- Should be competent in the extraction of the teeth under both local and general anaesthesia

- Competent to carry out certain minor oral surgical procedure under LA liketrans-alveolar extraction, frenectomy, dento alveolar procedures, simple impaction, biopsy etc
- 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
- Familiar with the management of major oral surgical problems and principles involved in the in patient management

4. TEACHING HOURS

Lecture Hours
III Year – 20 hours
IV Year – 50 hours

Clinical Hours
III Year – 70 hours
IV Year – 200 hours

5. TEACHING METHODOLOGY

- Combination of lectures
- Small group seminars, tutorials
- Clinical skills laboratory sessions
- Supervised clinical activity
- Problem based curriculum in problem solving and diagnosis.

6. **THEORY SYLLABUS INCLUDING BIO-ETHICS, DENTAL JURISPRUDENCE.**

Third Year

TOPIC	MUST KNOW	DESIRABLE TO KNOW	NICE TO KNOW
Introduction	Definition, Aims & objectives and scope of Oral and Maxillofacial surgery		

Diagnosis in oral surgery	History Taking		
Clinical Examination Investigations	Infection control	Principles of infection control Asepsis: Definition, measures to prevent infection during surgery Preparation of the patient Measures to be taken by operator Sterilisation of instruments - various methods of sterilisation etc. Cross infection, HIV/AIDS and hepatitis	
	Local Anaesthesia	Neurology of facial pain Historical aspects, definition, types of LA, indications, contraindications, advantages and disadvantages, concept of LA Local anaesthetic drugs, Classification Ideal requirements of LA solutions, composition and mode of action, Types of LA Choice of particular mode of anaesthesia Complications of LA, prevention and management. Anaesthesia technique- Mandible Pterygomandibular space - boundaries and contents, Interior dental nerve block- various techniques, complications, mental foramen nerve block Anaesthesia technique- Maxilla, Infraorbital nerve block, Posterior superior alveolar nerve block Use of vasoconstrictors in local anaesthetic solution, advantages, contraindications, various vasoconstrictors used	
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. Complications 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.	
Exodontia	Ideal extraction, Introduction, indications, contra indications, extraction in medically compromised individuals		
Methods of extraction- Forceps or intra alveolar or closed method. principles, types of movement and force, 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 exodontias, common to both maxilla and mandible, postoperative complications, Prevention and management of complications			
Medical Emergency Medical Compromised Patients	Primary care of medical emergencies in dental practice particularly – (a) Cardio vascular (b) Respiratory (c) Endocrine (d) Anaphylactic reaction (e) Epilepsy		
Painless Surgery: I. 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.			
Principles of oral surgery	Extra-oral: Skin incisions - principle's, various extra-oral incision to expose facial skeleton. a) Submandibular b) Pre-auricular c) Incision to expose maxilla & orbit d) Bicoronal incision e) Control of haemorrhage during surgery Normal Haemostasis Local measures available to control bleeding Hypotensive anaesthesia etc. f) Drainage and Debridement, Purpose of drainage: in surgical wounds Debridement: purpose, soft tissue as bone dement.		

	g) Closure of wounds Suturing: Principles, suture material, classification, body response to various materials etc. h) 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		
Ethics	**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 Geneve, International code of ethics, D.C.I. Code of ethics. **Ethics of the Individual** The patient as a person Right to be respected Truth and confidentiality Autonome of decision Doctor Patient relationship **Professional 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 out criteria towards decisions		
Dental 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		
Dento-alveolar Surgery	Trans alveolar extraction, Impacted teeth: General factors, Incidence, Aetiology, Classification Indications, Assessment: clinical & radiological, Anaesthetic considerations, Surgical procedures Endodontic surgery: Introduction, classification, apiceoctomy, replantation		
Impacted teeth	Incidence, definition, aetiology. (a) Impacted mandibular third molar. Classification, reasons for removal, Assessment - both clinical as 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, Localisation, indications for removal, Methods of management, labial and palatal approach, Surgical exposure, transplantation, removal etc.		
Infection of 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, Predisposing factors, classification, clinical features and management. Ludwig's angina - definition, aetiology, clinical features, management and complications Hepatitis B and HIV		
Cystic lesions of jaws	Definition, classification, pathogenesis Diagnosis, clinical features, radiological, aspiration biopsy, use of contrast media and histopathology Management-Types of surgical procedures, rationale of the technique, indications, procedure and complications		
Tumours of the oral Cavity	General considerations, Carcinoma of oral cavity, TNM classification	Role of dental surgeons in the prevention and early detection of oral cancer	

	Non-odontogenic benign tumours - lipoma, fibroma, papilloma, ossifying fibroma, myoma etc.		
	Ameloblastoma-Clinical features, radiographic features, methods of management of Carcinoma of oral cavity		
	Biopsy – types		
	Outline of management of squamous cell carcinoma, surgery, radiotherapy,		
Fractures of the jaws	General consideration, types of the fractures, Aetiology, C/F, and general principles. Dento-alveolar Fractures, methods of management	Management of fracture of condyle - aetiology, classification, clinical features and general principles of management reduction and fixation	
	Mandibular Fractures – Applied Anatomy, Classification Diagnosis – Clinical and Radiological Features Management- open and closed Fixation, Immobilisation methods, outline of rigid and semi rigid internal fixation	Orbital fractures & fractures of Zygomatic complex	
	Fractures of middle third of the face, Definition of mid-face, applied surgical anatomy, classification, clinical features and outline of management	Surgical anatomy, Dislocation - Types, aetiology, clinical features and management	
	Classification, clinical features, Indications for treatment, Various methods of reduction and fixation Alveolar fractures- methods of management		
	Ankylosis- definition, aetiology, clinical features and management		
TMJ disorders			Myofunctional pain

			dysfunction syndrome- aetiology, clinical features management, nonsurgical and surgical
			Internal derangement & Arthritis and other disorders
Diseases of maxillary Sinus	Surgical anatomy, Acute & chronic sinusitis Surgical approach of sinusitis- Caldwell-luc procedure, removal of root from the sinus		
	Oro-antral fistula – aetiology, clinical features and various surgical methods of closure		
Pre-prosthetic surgery	Introduction, aims Definition, classification of procedures. (a) Corrective procedures: Alveoloplasty, Reduction of maxillary tuberosity, Frenectemies 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		
Salivary gland diseases	Diagnosis of salivary gland diseases, sialography, contrast media, procedure, Salivary calculi and Infections of the salivary glands, sialolithiasis- Submandibular and parotid duct- clinical features and management, salivary fistulae, common tumours of salivary glands like pleomorphic adenoma including minor salivary glands	Tumours of the salivary gland and management	
Neurological disorders	Trigeminal neuralgia - Definition, Aetiology, C/F and methods of management including surgery. Glossopharyngeal and Facial paralysis - aetiology, clinical features	Nerve injuries - classification, neurorhaphy etc.	
Cleft lip and cleft palate			Aetiology of the clefts, Incidence, classification, Role of dental surgeon in the management of cleft patients. Outline of the

			closure procedures.
Developmental deformities			Basic forms, prognathism, retrognathism and open bite. Reasons for correction, Outline of surgical methods carried out on maxilla and mandible
Oral Implantology			Principles of implantology
Medical emergency in dental practice	Primary care of medical emergencies in dental practice particularly - (a)Cardio vascular (b) Respiratory(c) Endocrine (d)Anaphylactic reaction (0) Epilepsy		
Emergency drugs	Intramuscular iv injections, applied anatomy, ideal location of giving these injections, techniques etc.		

7. PRACTICALS
Procedures & Demonstrations

Third Year
Students should learn the following exercises:

- Case history taking
- Observe Cases in the Casualty
- Examination of the patient
- Recording blood pressure

- Use of different instruments in Oral & Maxillofacial surgery
- Various local anaesthetic injection techniques on patients

Practical and Clinical Quota

Clinical exercises	Quota
Extraction of Maxillary teeth	25 cases
Wiring techniques on models	1 exercise
Suturing techniques on models.	1 exercise

Final Year
PRACTICAL AND CLINICAL: 200 HOURS

STUDENTS ARE REQUIRED TO LEARN THE FOLLOWING EXERCISES:

- Case history taking
- Examination of the patient
- Recording blood pressure
- Use of different instruments in Oral & Maxillofacial surgery
- Various local anaesthetic injection techniques on patients
- Extraction of mobile and firm teeth
- Trans-alveolar extraction of root stumps
- Surgical removal of Simple impacted teeth
- Management of dento-alveolar fractures with arch bar fixation, eyelets and inter-maxillary fixations.
- Training in basic life support skills

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PRACTICAL AND CLINICAL QUOTA

Clinical exercises	Quota	Observe/Do/Assist
Extraction of teeth	60 cases	Do
Trans-alveolar method of extraction with suturing	5 cases	Assist
Management of dento-alveolar fractures with arch bar fixation, eyelets and inter-maxillary fixations	5 cases	Observe
IM & IV Injection techniques	5 cases	Do
Major surgical procedures under general anaesthesia	5 cases	Observe
Training in Handling medical emergencies, CPR and basic life support		Do

8. THEORY EXAMINATION (3 Hours)

Elaborate on: 2 x 10= 20 Marks
Write notes on: 10 x 5 = 50 Marks
Total Marks= 70 Marks

9. **PRACTICAL / CLINICAL EXAMINATIONS**

Clinicals in Oral Surgery: 70 + 20 = 90 Marks
A. 70 Marks
Case History : 20 Marks
Local anaesthesia technique: 30 Marks
Extraction of firm tooth : 20 Marks

(Maxillary/ Mandibular tooth) and
management of the patient

B. 20 Marks (Wiring techniques on models 10 marks) (Suturing techniques on models 10 marks)

C. Viva Voce : 20 marks

	Examination	Internal Assessment	Viva	Total
Theory	70	10	20	100
Practicals	90	10	-	100
Total				200

10. FORMATIVE/INTERNAL ASSESSMENT

The continuing assessment examination (both Theory/Practical) held at least 3times in a particular year and best of two examinations should be considered. The Internal Assessment marks to be submitted to the University, once in every three months. The marks scored by the students shall be displayed on the Notice board and a copy forwarded by HOD shall be sent to the University once in every 3 months.

Topics for each assessment
3rd Year
First Internal Assessment

Topic	**Details of the Topic**
Introduction	Definition, Aims & objectives and scope of Oral and Maxillofacial surgery
Diagnosis in oral surgery	History Taking
	Clinical Examination
	Investigations
Infection control	Principles of infection control Asepsis: Definition, measures to prevent infection during surgery Preparation of the patient Measures to be taken by operator Sterilisation of instruments - various methods of sterilisation etc. Cross infection, HIV/AIDS and hepatitis

Second Internal Assessment

Local Anaesthesia	Neurology of facial pain Historical aspects, definition, types of LA, indications, contraindications, advantages and disadvantages, concept of LA Local anaesthetic drugs, Classification Ideal requirements of LA solutions, composition and mode of action, Types of LA Choice of particular mode of anaesthesia Complications of LA, prevention and management. Anaesthesia technique- Mandible Pterygomandibular space - boundaries and contents, Interior dental nerve block- various techniques, complications, mental foramen nerve block Anaesthesia technique- Maxilla, Infraorbital nerve block, Posterior superior alveolar nerve block Use of vasoconstrictors in local anaesthetic solution, advantages, contraindications, various vasoconstrictors used
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. Complications 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.

Third Internal Assessment

Exodontia	Ideal extraction, Introduction, indications, contra indications, extraction in medically compromised individuals
	Methods of extraction-Forceps or intra alveolar or closed method. principles, types of movement and force, 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 exodontias, common to both maxilla and mandible, postoperative complications, Prevention and management of complications
Medical Emergency Medical Compromised Patients	Primary care of medical emergencies in dental practice particularly – (a)Cardio vascular (b) Respiratory (c) Endocrine (d)Anaphylactic reaction (e) Epilepsy

Final Year

First Internal Assessment

Principles of oral surgery	Painless Surgery: I. 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 - principle's, various extra-oral incision to expose facial skeleton. a) Submandibular b) Pre-auricular c) Incision to expose maxilla & orbit d) Bicoronal incision e) Control of haemorrhage during surgery Normal Haemostasis Local measures available to control bleeding Hypotensive anaesthesia etc. f) Drainage and Debridement, Purpose of drainage: in surgical wounds Debridement: purpose, soft tissue as bone dement. g) Closure of wounds Suturing: Principles, suture material, classification, body response to various materials etc. h) 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
Ethics	**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, D.C.I. 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 **Professional 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 out criteria towards decisions
Dental 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
Dento-alveolar Surgery	Trans alveolar extraction, Impacted teeth: General factors, Incidence, Aetiology, Classification Indications, Assessment: clinical & radiological, Anaesthetic considerations, Surgical procedures Endodontic surgery: Introduction, classification, apiceoctomy, replantation
Impacted teeth	Incidence, definition, aetiology. (a) Impacted mandibular third molar. Classification, reasons for removal, Assessment - both clinical as 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, Localisation, indications for removal, Methods of management, labial and palatal approach, Surgical exposure, transplantation, removal etc.

Second Internal Assessment

Infection of oral	Introduction, factors responsible for infection, course of odontogenic infections, spread of odontogenic infections through various facial spaces. Dento-alveolar

cavity	abscess- aetiology, clinical features and management. Osteomyelitis of the jaws - Definition; Aetiology, Predisposing factors, classification, clinical features and management. Ludwig's angina - definition, aetiology, clinical features, management and complications Hepatitis B and HIV
Cystic lesions of jaws	Definition, classification, pathogenesis Diagnosis, clinical features, radiological, aspiration biopsy, use of contrast media and histopathology Management-Types of surgical procedures, rationale of the technique, indications, procedure and complications
Tumours of the oral Cavity	General considerations, Carcinoma of oral cavity, TNM classification Non-odontogenic benign tumours - lipoma, fibroma, papilloma, ossifying fibroma, myoma etc. Ameloblastoma-Clinical features, radiographic features, methods of management of Carcinoma of oral cavity Biopsy – types, TNM classification Outline of management of squamous cell carcinoma, surgery, radiotherapy, chemotherapy. Role of dental surgeons in the prevention and early detection of oral cancer
Fractures of the jaws	General consideration, types of the fractures, Aetiology, C/F, and general principles. Dento-alveolar Fractures, methods of management Mandibular Fractures – Applied Anatomy, Classification Diagnosis – Clinical and Radiological Features Management- open and closed Fixation, Immobilisation methods, outline of rigid and semi rigid internal fixation Management of fracture of condyle - aetiology, classification, clinical features and general principles of management reduction and fixation Fractures of middle third of the face, Definition of mid-face, applied surgical anatomy, classification, clinical features and outline of management

	Orbital fractures & fractures of Zygomatic complex
	Classification, clinical features, Indications for treatment, Various methods of reduction and fixation Alveolar fractures- methods of management
	Complications - delayed union, non-union and malunion.
	Surgical anatomy, Dislocation- Types, aetiology, clinical features and management
	Ankylosis- definition, aetiology, clinical features and management
TMJ disorders	Myofunctional pain dysfunction syndrome-aetiology, clinical features management, nonsurgical and surgical
	Internal derangement & Arthritis and other disorders
Diseases of maxillary Sinus	Surgical anatomy, Acute & chronic sinusitis Surgical approach of sinusitis- Caldwell-luc procedure, removal of root from the sinus
	Oro-antral fistula –aetiology, clinical features and various surgical methods of closure

Third Internal Assessment

Pre-prosthetic surgery	Introduction, aims Definition, classification of procedures. (a) Corrective procedures: Alveoloplasty, Reduction of maxillary tuberosity, Frenectemies 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
Salivary gland diseases	Diagnosis of salivary gland diseases, sialography, contrast media, procedure, Salivary calculi and Infections of the salivary glands,

	sialolithiasis- Submandibular and parotid duct- clinical features and management, salivary fistulae, common tumours of salivary glands like pleomorphic adenoma including minor salivary glands Tumours of the salivary gland and management
Neurological disorders	Trigeminal neuralgia - Definition, Aetiology, C/F and methods of management including surgery. Glossopharyngeal and Facial paralysis - aetiology, clinical features
	Nerve injuries - classification, neurorhaphy etc.
Cleft lip and cleft palate	Aetiology of the clefts, Incidence, classification, Role of dental surgeon in the management of cleft patients. Outline of the closure procedures.
Developmental deformities	Basic forms, prognathism, retrognathism and open bite. Reasons for correction, Outline of surgical methods carried out on maxilla and mandible
Oral Implantology	Principles of implantology
Medical emergency in dental practice	Primary care of medical emergencies in dental practice particularly - (a)Cardio vascular (b) Respiratory(c) Endocrine (d)Anaphylactic reaction (e) Epilepsy
Emergency drugs	Intramuscular iv injections, applied anatomy, ideal location of giving these injections, techniques etc.

Schedule for each assessment

First November
Second February
Third May
Model Exam July

11. RECORD NOTE/LOG BOOK

Record shall be maintained and assessed periodically by faculty and HOD. Institution shall provide adequate number of cases/teaching materials as specified in Dental Council of India regulation for the students during clinical/practical training and examinations.

12. TEXT BOOKS

i. Alling John F et al Impacted teeth
ii. Srinivasan B Textbook of Oral and Maxillofacial Surgery
iii. Malamed S F Handbook of medical emergencies in the dental office
iv. Banks P Killey's fracture of mandible
v. Banks P Killey's fracture of middle third of the facial skeleton
vi. McGovanda The Maxillary sinus and its dental implication
vii. Seward G R et al Killey and Kays outline of oral surgery Part I
viii. Mc Carthy F M Essentials of safe dentistry for the medically compromised patients
ix. Laskin D M Oral and Maxillofacial Surgery
x. Howe G L Extraction of teeth
xi. Howe G L Minor oral surgery
xii. Balaji SM Textbook of Oral & Maxillofacial Surgery

13. REFERENCE BOOKS

i. Peterson L J et al Principles of Oral and Maxillofacial Surgery Vol 1,2 & 3
ii. Peterson l J et al Contemporary Oral and Maxillofacial Surgery
iii. Topazian R G & Goldberg M H Oral and Maxillofacial infections
iv. Impacted teeth; Alling John F et al.
v. Principles of oral and maxillofacial surgery; Vol.1,2 & 3 Peterson LJ et al.
vi. Text book of oral and maxillofacial surgery: Srinivasan B.
vii. Handbook of medical emergencies in the dental office, Malamed SF.
viii. Killeys Fractures of the mandible; Banks P.
ix. Killeys fractures of the middle 3rd of the facial skeleton; Banks P.
x. The maxillary sinus and its dental implications; McGovanda
xi. Killey and Kays outline of oral surgery – Part-1: Seward GR et al
xii. Essentials of safe dentistry for the medically compromised patients; Mc Carthy FM
xiii. Oral & maxillofacial surgery, Vol 2; Laskin Dm

BRANCH – 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.
- **Computer based lab skills**
- **Forensic digital and manual record maintenance**.

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 of Dentofacial 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.

All MDS candidates shall compulsorily attend the Research Methodology Workshop conducted by the University within 6 months from the date of joining the course. In this regard, the candidates will be issued a completion Certificate by the University.

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 and **diseases like diabetes,hypertension and blood dyscrasias.**

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.
- **Tell show do technique –training skills.**

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.

TEACHING LEARNING METHODS (including Clinical Study)

(a) LECTURES:

There shall be some didactic lectures in the speciality and in the allied fields. The departments shall encourage guest lectures in the required areas and integrated lectures by multi-disciplinary teams on selected topics, to strengthen the training programmes.

(b) JOURNAL REVIEW:

The journal review meetings shall be held at least once a week. All trainees, associate and staff associated with the post-graduate programme are expected to participate actively and enter relevant details in the logbook. The trainee shall make presentations from the allotted journals of selected articles.

(c) SEMINARS:

The seminars shall be held at least twice a week in each department. All trainees are expected to participate actively and enter relevant details in logbook.

(d) SYMPOSIUM:

It is recommended to hold symposium on topics covering multiple disciplines.

(e) CLINICAL POSTINGS:

Each trainee shall work in the clinics on regular basis to acquire adequate professional skills and competency in managing various cases.

(f) CLINICO-PATHOLOGICAL CONFERENCE:

The clinico pathological conference shall be held once a month involving the faculties of Oral Medicine and Radiology, Oral Pathology and allied clinical departments. The trainees shall be encouraged to present the clinical details, radiological and histo-pathological interpretations and participation in the discussions.

(g) INTER-DEPARTMENTAL MEETINGS:

To encourage integration among various specialities, there shall be inter-departmental meeting chaired by the Dean with all heads of post-graduate departments at least once a month.

(h) TEACHING SKILLS:

All the trainees shall be encourages to take part in undergraduate teaching programmes either in the form of lectures or group discussion.

(i) DENTAL EDUCATION PROGRAMMES:

Each department shall organise dental education programmes on regular basis involving other institutions. The trainees shall also be encouraged to attend such programmes conducted outside their university or institute.

(j) CONFERENCES/WORKSHOPS/ADVANCED COURSES:

The trainees shall be encouraged to attend conference/workshops/advanced courses and also to present at least two scientific papers and two posters at State/national level speciality and allied conferences/conventions during the training period.

(k) ROTATION AND POSTING IN OTHER DEPARTMENTS:

To bring in more integration among the specialities and allied fields, each department shall workout a programme to rotate the trainees in related disciplines.

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	Bar attachment
	Screw retained	Ball attachment
	Clip attachment	
• Tooth and implant Supported	Screw retained Cement retained	Screw retained Cement retained
• **Root supported**	Dowel and core	Over denture
	Pin retained	

- 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

o Cranial
o Maxillectomy
o Hemimandibulectomy
o Finger prosthesis
o Guiding flange
o 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				5
b) Ceramics – laminates, inlays, onlays				5
c) Glass Ionomer				5
CROWNS				

FVC for metal	1	2	2	10
FVC for ceramic	1	2	2	10
Precious metal crown or Galvanoformed crown	1	-	1	5
Intra radicular crowns (central, lateral, canine, premolar, and molar)	1	-	-	5
	As many	5	5	5
FIXED PARTIAL DENTURES				
Cast Porcelain (03 Units)			1	5
Cast Metal / Precious & Non Precious (3unit posterior)			1	5
Porcelain fused to metal (anterior and posterior)	1	1	1	10
Multiple abutments – maxillary and Mandibular full arch	1	1	1	5

Incorporation of custom made and prefabricated precision attachments	1	1	2	4
Adhesive bridge for anterior/posterior		-		5
CAD – CAM Anterior/Posterior FPD	-	-		5
Metal fused to resin Anterior FPD			1	5
Interim provisional restorations (crowns and FPDs)	1	1	1	10
Immediate fixed partial dentures (interim) with ovate pontic	1	-	-	5
Fixed prosthesis as a retention and rehabilitation means for acquired and congenital defects – maxillofacial Prosthetics	1	1	1	5
Implant supported prosthesis	1	-	1	1
Implant – tooth supported prosthesis	1	-	1	1
REMOVABLE PARTIAL DENTURE				
Provisional partial denture prosthesis	1	1	1	10
Cast removable partial denture (for Kennedy's Applegate classification with modifications)	1	1	1	6
Removable bridge with precision attachments and Telescopic crowns for anterior and posterior edentulous Spaces	1	1	2	4
Immediate RPD	1	1	1	5
Partial denture for medically compromised and Handicapped patients	1	1	1	5
COMPLETE DENTURES				
Anatomic characterized prosthesis (by using semi adjustable articulator)	-	-	1	25

Single dentures	-	-	1	5
Overlay dentures	-	-	1	5
Interim complete dentures as a treatment prosthesis for abused denture supporting tissues	-	-	1	5
Complete denture prosthesis (for abnormal ridge relation, ridge form and ridge size)	-	-	1	5
Complete dentures for patients with TMJsyndromes	-	-	1	5
Complete dentures for medically compromised and handicapped patients	-	-	1	5
GERIATRIC PATIENTS				
Handling geriatric patients requiring nutritional counseling, psychological management and management of co-morbitity including xerostomia and systemic problems. Palliative care to elderly.				30
IMPLANT SUPPORTED COMPLETE PROSTHESIS				
Implant supported complete prosthesis (maxillary And Mandibular)	-	-	1	1
MAXILLOFACIAL PROSTHESIS				
Guiding flange obturator	-	-	1	4
Speech and palatal lift prosthesis			1	2
eye prosthesis			1	2
Ear prosthesis			1	2
Nose prosthesis			1	2
Face prosthesis			1	
Maxillectomy			1	2
Hemi mandibulectomy			1	2
Cranioplasty			1	1
Finger head foot			1	2
Body prosthesis			1	1
Management of burns and 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	-	-	-	1

freedom to move from IP to CRCP				
In IP without the freedom to move to CRCP	-	-	-	1
Repositioning appliances, Anterior Disocclusion appliances	-	-	-	2
Chrome cobalt and acrylic resin stabilization appliances for modification to accommodate for the irregularities in the dentition	-	-	-	2
Occlusal adjustment and occlusal equilibrium appliances	-	-	1	4
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 failures of psychogenic origin	-	-	-	5
Restoration failures to age changes	-	-	-	2

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SCEINTIFIC PRESENTATIONS;

Journal club -5

Seminar -5

Scentific paper-3

Sceintific poster-3

Clinical discussion- 2

Other posting -1

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DISSERTATION- Submission of Protocol, Continuous Evaluation of Dissertation, Submission of completed Dissertation:

Every candidate appearing for the post-graduate degree examination shall at least six months prior to the examinations, submit with his form for examination, four typewritten copies of the dissertation undertaken by the candidate, prepared under the direction and guidance of his/her guide.

It must be approved by the Institutional Review Board consisting of Principal, all the HOD's, an advocate, medical specialties and social worker within the first six months after the commencement of the course. The application for registration of dissertation topic must be sent through the Principal duly forwarded by the Professor/ HOD. The University will register such dissertation topic. In case, the students want to change the topic of dissertation, they can do it within the next three months. No change in the Guide/dissertation topic shall be made without prior approval of the University.

The aim of dissertation is to train a postgraduate student in research methodology. It includes identification of a problem with recent advances, designing of research study on collection of data, practical analysis and comparison of results and drawing conclusions.

The dissertation should be written under the following headings.

Introduction / Aims and objective/ Review and literature/ Materials & Methods/ Results/ Discussion

Conclusion/Summary

The written text of dissertation shall not be less than 100pages. It should be neatly typed in double line spacing on one side (A4 size, 8. 27"x 11.69") and bounded properly.

Photos, charts, tables, tables and graphs can be attached where ever necessary. Spiral binding should not be used. The dissertation shall be certified by the Guide and Head of the department and forwarded by the Principal to the University.

The dissertation so submitted shall be referred to the examiners for their examination and acceptance of it shall be a condition precedent to allow the candidate to appear for the written part of the examination.

Provided that a candidate whose dissertation has been accepted by the examiner, but declared failed at the examination, shall be permitted to re-appear at the subsequent examination without a new dissertation.

Provided further that if the dissertation is rejected by the examiner, the examiner shall assign reasons thereof with suggestions for its improvement to the candidate and such candidate shall re-submit his/ her dissertation to the examiner who shall accept it before appearing in the examination.

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 five short***

answers of 10 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

DAY - 1

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

DAY - 2

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*

DAY - 3

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*

Refer to Syllabus and Curriculum for the M.D.S.Courses 2018-19.

10. LOG BOOK

MASTER OF DENTAL SURGERY

POST GRADUATE PROFILE **PROSTHODONTICS AND CROWN AND BRIDGE** 2015-2018

TAMILNADU DR MGR MEDICAL UNIVERSITY,GUINDY

PRECONFERENCE COURSE ATTENDED

1. State Level

2. National Level

3. International Level

CDE PROGRAMMES ATTENDED

1. State Level

2. National Level

CONFERENCES AND CONVENTIONS ATTENDED

1. State Level

2. National Level

3. International Level

TABLE CLINIC PRESENTATION

1. State Level

2. National Level

SCIENTIFIC POSTERS PRESENTED

1. State Level

2. National Level

3. International Level

SCIENTIFIC PAPERS PRESENTED

1. State Level

2. National Level

3. International Level

THESIS/DISSERTATION - 1

LIBRARY DISSERTATION -1

JOURNAL CLUS PRESENTED (05 per Year)

SEMINARS PRESENTED (05 per Year)

PRECLINICAL WORKS

COMPLETE DENTURE PROSTHODONTICS

S NO	NAME OF EXERCISE	STATUS
1.	CAST PREPARATION UPPER AND LOWER	12
2.	SPECIAL TRAY MAXILLARY MANDIBULAR	3
3.	TEMPORARY SHELLAC DENTURE BASE MAXILLARY MANDIBULAR	3
4.	SPECIAL TRAY SELF CURE MAXILLARY MANDIBULAR	3
5	CLASS 1 TEETH ARRANGEMENT	1
6.	CLASS 2 TEETH ARRANGEMENT	1
7.	CLASS 3 TEETH ARRANGEMENT	1

REMOVABLE PARTIAL DENTURE

S.NO	NAME OF EXERCISE	STATUS
1.	KENNEDYS CLASS 1 PREPARATION	1
2.	KENNEDYS CLASS 2 PREPARATION	1
3.	KENNEDYS CLASS 3 PREPARATION	1
4.	KENNEDYS CLASS 4 PREPARATION	1
5.	CASTING PROCEDURES	1

FIXED PROSTHODONTICS

S.NO	NAME OF EXERCISE	STATUS
1.	PREPARATION FOR FULL METAL CROWNS	1
2.	PREPARATION FOR ALL CERAMIC CROWNS-ANTERIOR	1
3.	PREPARATION FOR ALL CERAMIC CROWNS-POSTERIOR	1
4.	PREPARATION FOR FULL METAL CERAMIC CROWNS	1
5.	PREPARATION FOR PARTIAL VENEER CROWNS	1
6.	DIE PREPATRATION	1
7.	CASTING PROCEDURES	1

CLINICAL CASES

S.NO	NATURE OF WORK	NOS
1.	COMPLETE DENTURE	75
2.	REMOVABLE PARTIAL DENTURE	30
3.	FIXED PARTIAL DENTURE	30

SPECIALITY CASES - 15

S.NO	NAME	NATURE OF WORK

Compulsorily Clinical and Preclinical Records should be approved by the HOD

10. VIVA

Conducted once in every month for each PG by The HOD /Professor.

VIVA 80 marks

11. PEDAGOGY

Conducted once in every month for each PG-Topic to be given by the Head of the Department.

Pedagogy -20 marks

12. REFERENCE BOOKS

1. Essential of Complete Denture Prosthodontics - Winkler
2. Prosthodontic Treatment for Edentluous Patients - Zarb Bolender
3. Impression Techniques for Complete Denture - Bernard Levin
4. Clinical Removable Partial Denture -Stewart
5. Removable Partial Prosthodontics - Mc Cracken
6. Fundamentals of Fixed Prosthodontics -Shillingburg
7. Contemporary Fixed Partial Denture - Rosenstiel
8. Functional Occlusion from TMJ to Smile Design -Peter E Dawson
9. Maxillofacial Prosthodontics -Thomas D Taylor
10. Maxillofacial Rehabilitation -John Beumer III
11. Dental Implant Prosthetics - Carl E Misch
12. Contemporary Implant Dentistry -Carl E Misch
13. TextBook Of Prosthodontics -Deepak Nallaswamy

13. JOURNALS

1. Journal of Indian Prosthodontic Society
2. Journal of Prosthetic Dentistry
3. Journal of Prosthetic Research
4. Journal of Prosthodontics
5. Journal of Advanced Prosthodontics
6. Journal of Clinical Dentistry and Research
7. Journal of Oral Implantology

Minimum of 20 journals presentation in 3 years by each PG.

BRANCH – II 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

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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

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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
- **Prosthodontic**

(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
3. **Instruments used in various parts of the mouth**

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

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(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.

Training in research methodology, Biostatistics, Ethics / Bio-ethics in dentistry, Jurisprudence and Audits-

Adopt ethical principles in all periodontic practice. Professional honesty and integrity are to be fostered. Treatment to be delivered irrespective of social status, caste, creed or religion of patient. Respect patient's rights and privileges including patients right to information and right to seek second opinion. Understanding, Observation, Correlation, Experimentation and evaluating dental research, scientific method, hypothesis and Research Strategies.

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.

All MDS candidates shall compulsorily attend the Research Methodology Workshop conducted by the University within 6 month from the date of joining the course. In this regard, the candidates will be issued a completion Certificate by the University.

TEACHING LEARNING METHODS (including Clinical Study)

(a) LECTURES:

There shall be some didactic lectures in the speciality and in the allied fields. The departments shall encourage guest lectures in the required areas and integrated lectures by multi-disciplinary teams on selected topics, to strengthen the training programmes.

(b) JOURNAL REVIEW:

The journal review meetings shall be held at least once a week. All trainees, associate and staff associated with the post-graduate programme are expected to participate actively and enter relevant details in the logbook. The trainee shall make presentations from the allotted journals of selected articles.

(c) SEMINARS:

The seminars shall be held at least twice a week in each department. All trainees are expected to participate actively and enter relevant details in logbook.

(d) SYMPOSIUM:

It is recommended to hold symposium on topics covering multiple disciplines.

(e) CLINICAL POSTINGS:

Each trainee shall work in the clinics on regular basis to acquire adequate professional skills and competency in managing various cases.

(f) CLINICO-PATHOLOGICAL CONFERENCE:

The clinico pathological conference shall be held once a month involving the faculties of Oral Medicine and Radiology, Oral Pathology and allied clinical departments. The trainees shall be encouraged to present the clinical details, radiological and histo-pathological interpretations and participation in the discussions.

(g) INTER-DEPARTMENTAL MEETINGS:

To encourage integration among various specialities, there shall be inter-departmental meeting chaired by the Dean with all heads of post-graduate departments at least once a month.

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(h) TEACHING SKILLS:

All the trainees shall be encourages to take part in undergraduate teaching programmes either in the form of lectures or group discussion.

(i) DENTAL EDUCATION PROGRAMMES:

Each department shall organise dental education programmes on regular basis involving other institutions. The trainees shall also be encouraged to attend such programmes conducted outside their university or institute.

(j) CONFERENCES/WORKSHOPS/ADVANCED COURSES:

The trainees shall be encouraged to attend conference/workshops/advanced courses and also to present at least two scientific papers and two posters at State/national level speciality and allied conferences/conventions during the training period.

(k) ROTATION AND POSTING IN OTHER DEPARTMENTS:

To bring in more integration among the specialities and allied fields, each department shall workout a programme to rotate the trainees in related disciplines.

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**)	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

Journal clubs- 5
Seminars 5
Lectures 5
Clinico Pathological conference 2 presentations in 3 years
Conferences 2 paper and 2 poster in 3 years

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.

DISSERTATION

Every candidate appearing for the post-graduate degree examination shall at least six months prior to the examinations, submit with his form for examination, four typewritten copies of the dissertation undertaken by the candidate, prepared under the direction and guidance of his/her guide.

It must be approved by the Institutional Review Board consisting of Principal, all the HOD's, an advocate, medical specialties and social worker within the first six months after the commencement of the course. The application for registration of dissertation topic must be sent through the Principal duly forwarded by the Professor/ HOD. The University will register such dissertation topic. In case the students want to change the topic of dissertation, they cando it within the next three months. No change in the Guide/dissertation topic shall be made without prior approval of the University.

The aim of dissertation is to train a postgraduate student in research methodology. It includes identification of a problem with recent advances, designing of research study on collection of data, practical analysis and comparison of results and drawing conclusions.

The dissertation should be written under the following headings.

Introduction / Aims and objective / Review and literature / Materials & Methods /Results / Discussion

Conclusion / Summary

The written text of dissertation shall not be less than 100pages. It should be neatly typed in double line spacing on one side (A4 size, 8. 27"x 11.69") and bounded properly. Photos, charts, tables, tables and graphs can be attached where ever necessary. Spiral binding should not be used. The dissertation shall be certified by the Guide and Head of the department and forwarded by the Principal to the University.

The dissertation so submitted shall be referred to the examiners for their examination and acceptance of it shall be a condition precedent to allow the candidate to appear for the written part of the examination.

Provided that a candidate whose dissertation has been accepted by the examiner, but declared failed at the examination, shall be permitted to re-appear at the subsequent examination without a new dissertation.

Provided further that if the dissertation is rejected by the examiner, the examiner shall assign reasons thereof with suggestions for its improvement to the candidate and such candidate shall re-submit his/ her dissertation to the examiner who shall accept it before appearing in the examination.

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)

**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.

REFERENCE BOOKS

1. Clinical Periodontology by Carranza and Newmann
2. Contemporary Periodontics by Robert GencoHenry.M.Goldman D Walter Cohen
3. Clinical Periodontology &Implant Dentistry by Jan Lindhe,T.Karning,N.P.Lang
4. Manual of periodontal Instruments by Glickman
5. Periodontics by Grant SternListgarten
6. Atlas of Periodontal Surgery by Cohen
7. Contemporary Implant dentistry by Carl E .Misch

JOURNALS

1. Journal of Periodontology
2. Journal of Clinical Periodontology
3. Journal of Periodontal Research
4. Journal of Clinical Periodontology
5. Periodontology 2000
6. Journal of Implantology
7. Journal of dental implants
8. Journal of oral implantology

BRANCH IV - 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.
- Eruption of teeth

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.

Training in Research Methodology, Biostatistics, Ethics / Bioethics, in Dentistry, Jurisprudence and Audits:

- Respect human life and the dignity of human individual
- Refrain from supporting or committing crimes against humanity and condemn all such acts
- Treat the sick and injured with competence and compassion
- Protect the privacy and confidentiality of those whom we care.
- Work freely with colleagues
- Educate the public
- Teach and mentor those who follow us

All MDS candidates shall compulsorily attend the Research Methodology Workshop conducted by the University within 6 months from the date of joining the course. In this regard, the candidates will be issued a completion Certificate by the University.

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.
25. Principles of esthetics.

- Color
- Facial analysis
- Smile design
- Principles of esthetic integration
- Treatment planning in esthetic dentistry

Paper-II: Endodontics

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

31. Restoration of endodontically treated teeth, recent advances
32. Effect of age and systemic health endodontics, with emphasis on treatment of medically complex endodontic patient.
33. Rhinosinusitis and endodontic disease
34. Vital pulp therapy
35. Records and legal responsibilities
36. Inflammation and immunology in endodontics
37. Non microbial endodontic disease
38. Pulpal reaction to caries and endodontic procedures
39. Bleaching principles
40. Outcome of endodontic treatment
41. Cracks and fracture

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)
   5. 7/8 crown - 02
   (1 to be processed)
   6. 3 / 4 crown premolar - 02
   (1 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	Amalgam (Cl II MO/DO/MOD)	30
B	Composite restorations	30
C	GIC Restorations	30

D	Complex amalgam restorations	05
E	Composite inlay + veneers (direct and indirect)	10
F	Ceramic jacket crowns	05
G	Post and core for anterior teeth	10
H	Bleaching vital	05
	Non vital	05
I	RCT Anterior	20
J	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 - 1/year
- Internal assessment – theory and clinical
- Clinical Case Discussion – 5/year
- Scientific Publication – 1(during the M.D.S course)
- Scientific Presentations - 4(during the M.D.S course with a minimum of 2 papers)
- Specialty Conferences and/or PG Conventions attended - 3(during the M.D.S course)

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.

The teaching and learning activities in each speciality shall be as under

(a) LECTURES:

There shall be some didactic lectures in the speciality and in the allied fields. The departments shall encourage guest lectures in the required areas and integrated lectures by multi-disciplinary teams on selected topics, to strengthen the training programmes.

(b) JOURNAL REVIEW:

The journal review meetings shall be held at least once a week. All trainees, associate and staff associated with the post-graduate programme are expected to participate actively and enter relevant details in the logbook. The trainee shall make presentations from the allotted journals of selected articles.

(c) SEMINARS:

The seminars shall be held at least twice a week in each department. All trainees are expected to participate actively and enter relevant details in logbook.

(d) SYMPOSIUM:

It is recommended to hold symposium on topics covering multiple disciplines.

(e) CLINICAL POSTINGS:

Each trainee shall work in the clinics on regular basis to acquire adequate professional skills and competency in managing various cases.

(f) CLINICO-PATHOLOGICAL CONFERENCE:

The clinico pathological conference shall be held once a month involving the faculties of Oral Medicine and Radiology, Oral Pathology and allied clinical departments. The trainees shall be encouraged to present the clinical details, radiological and histo-pathological interpretations and participation in the discussions.

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(g) INTER-DEPARTMENTAL MEETINGS:

To encourage integration among various specialities, there shall be inter-departmental meeting chaired by the Dean with all heads of post-graduate departments at least once a month.

(h) TEACHING SKILLS:

All the trainees shall be encourages to take part in undergraduate teaching programmes either in the form of lectures or group discussion.

(i) DENTAL EDUCATION PROGRAMMES:

Each department shall organise dental education programmes on regular basis involving other institutions. The trainees shall also be encouraged to attend such programmes conducted outside their university or institute.

(j) CONFERENCES/WORKSHOPS/ADVANCED COURSES:

The trainees shall be encouraged to attend conference/workshops/advanced courses and also to present at least two scientific papers and two posters at State/national level speciality and allied conferences/conventions during the training period.

(k) ROTATION AND POSTING IN OTHER DEPARTMENTS:

To bring in more integration among the specialities and allied fields, each department shall workout a programme to rotate the trainees in related disciplines.

DISSERTATION

Every candidate appearing for the post-graduate degree examination shall at least six months prior to the examinations, submit with his form for examination, four typewritten copies of the dissertation undertaken by the candidate, prepared under the direction and guidance of his/her guide.

It must be approved by the Institutional Review Board consisting of Principal, all the HOD's, an advocate, medical specialties and social worker within the first six months after the commencement of the course. The application for registration of dissertation topic

must be sent through the Principal duly forwarded by the Professor/ HOD. The University will register such dissertation topic. In case the students want to change the topic of dissertation, they cando it within the next three months. No change in the Guide/dissertation topic shall be made without prior approval of the University.

The aim of dissertation is to train a postgraduate student in research methodology. It includes identification of a problem with recent advances, designing of research study on collection of data, practical analysis and comparison of results and drawing conclusions.

The dissertation should be written under the following headings.

Introduction / Aims and objective / Review and literature / Materials & Methods / Results /

Discussion

Conclusion / Summary

The written text of dissertation shall not be less than 100pages. It should be neatly typed in double line spacing on one side (A4 size, 8. 27”x 11.69”) and bounded properly. Photos, charts, tables, tables and graphs can be attached where ever necessary. Spiral binding should not be used. The dissertation shall be certified by the Guide and Head of the department and forwarded by the Principal to the University.

The dissertation so submitted shall be referred to the examiners for their examination and acceptance of it shall be a condition precedent to allow the candidate to appear for the written part of the examination.

Provided that a candidate whose dissertation has been accepted by the examiner, but declared failed at the examination, shall be permitted to re-appear at the subsequent examination without a new dissertation.

Provided further that if the dissertation is rejected by the examiner, the examiner shall assign reasons thereof with suggestions for its improvement to the candidate and such candidate shall re-submit his/ her dissertation to the examiner who shall accept it before appearing in the examination.

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.

REFERENCE BOOKS

1. Fractures of the teeth, prevention and treatment of the vital and non-vital pulp by Basrani
2. Textbook of operative dentistry by Baum
3. Dentin and pulp in restorative dentistry by Brannstorm
4. Principles and practice of operative dentistry by Charbeneau
5. Operative dentistry by Gilmore
6. Esthetic composite bonding by Jordan
7. Operative dentistry: modem theory and practice by Marzook
8. Art, science and practice of operative dentistry by Sturdevant
9. Atlas of operative dentistry - pre clinical and clinical procedures by Evans & Wetz
10. New concepts in operative dentistry by Fusiyama
11. Handbook of clinical Endodontics by Bence.
12. Pathways of the pulp by Cohen & Burns
13. Bleaching teeth by Feinman
14. Endodontic practice by Grossman
15. Problem solving in Endodontics, prevention, identification and management by Gutmann
16. Endodontics in clinical practice by Harty
17. Endodontics by Ingle & Taintor
18. Endodontics- science and practice by Schroeder
19. Endodontology - biologic considerations in Endodontic procedures by Seltzer
20. Restoration of the endodontically treated tooth by Schillingberg & Kessler
21. Principles and practice of Endodontics by Walton & Torabinejad
22. Endodontic therapy by Franklin S Weine
23. Fundamentals of operative dentistry-James B summit
24. Surgical endodontics-Gutmann

BRANCH V - 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:

(components of post graduate curriculum)

The program outlined, addresses both the knowledge needed in Orthodontics and allied Medical specialties in its scope.

Theoretical knowledge:

All the teaching faculty and especially Professors should actively take part in imparting clinical, theoretical knowledge to each of the student. The students can be posted on rotation under each Professor and also have their clinical cases guided equally by all of them. The Associate Professors shall also discuss and guide / co – guide the students if they have adequate teaching experience

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
   Composites:
   Composition types, properties, setting reaction
d. Banding and bonding cements:
e. Wrought metal alloys:
   Deformation, strain hardening, annealing, recovery, recrystallization, grain growth, properties of metal alloys
f. Orthodontic arch wires
g. Elastics:
   Latex and non-latex elastics.
h. Applied physics, Bioengineering and metallurgy:
i. Specification and tests methods used for materials used in Orthodontics:
j. 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

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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

Orthodontic History:

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.
i. Orthodontic office design

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

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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)

Practical and clinical skills

PRE – CLINICAL EXERCISES (Practical exercises)
(Should be completed within 3 months) The students should be posted in rotation under all professors/ eligible teaching faculty.

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 exercise

9. 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.

a) Typodont exercise

- Band making
- Bracket positioning and placement
- Different stages in treatment appropriate to technique taught

10. Clinical photography
11. Computerized imaging (Computerised digital tracing using computer softwares and treatment predictions using software)
12. Preparation of surgical splints, and splints for TMJ problems.
13. Handling of equipment like vacuum forming appliances and hydro solder etc.(vacuum formed cap splint)

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	Inclined plane	1
8	Splint for Bruxism	1
9.	Catalans appliance	1
10.	Activator	1
11.	Bionator	1
12.	Frankel-FR 1& 2 appliance	2
13.	Twin block	1
14.	Lingual arch	1
15.	TPA	1

16.	Quad helix	1
17.	Utility arches	1
18.	Pendulum appliance	1
19.	Canine Retractor**(Marcotte & PG Spring)**	1
20.	Maxillary intrusion splint with tube positioning for headgear.	1
21.	Occlusal splint U/L with biostar	1

5. FIXED APPLIANCES – COMPONENTS

Nance holding arch(19 gauge)
Lower lingual arch(19 gauge)
Transpalatal arch(19 gauge)
Quad helix (19 gauge)
Fixed tongue crib(21 gauge)
Hass expansion applliance (19 gauge)
Adam's clasp with soldered buccal tube (21 gauge)

6. LIGHT ARCH ROUND WIRE EXERCISES:

- **STRAIGHTENING OF WIRE 3 INCHES IN LENGTH (0.016")- one number**
- **CUSPID CIRCLE (0.016")**
- **BOOT SHAPE INTERMAXILLARY HOOK (0.016")**
- **5 VERTICAL LOOPS (0.0 16")**
- **BAYONET BENDS (0.016")**
- **BUCCOLINGUAL OFFSET BENDS (0.016")**
- **MOLAR STOP OR LUG (0.016")**
- **DOUBLE BACK BEND (0.016")**
- **UPPER PLAIN ARCH FORM (0.016")**
- **LOWERARCH FORM WITH INTERMAXILLARY HOOK (0.016")**
- **UPPER PLAIN ARCH WIRE WITH BAYONETBENDS(0.016")**
- **PLAINARCH WITH TOE IN BENDS (0.016")**
- **PLAIN ARCH WITH TOE OUT BENDS (0.016")**
- **UPPER PLAIN ARCH FORM WITH ANCHOR BEND (0.016")**
- **LOWER LOOPED ARCH WIRE WITH ANCHOR BEND (0.016")**
- **STAGE II ARCH WIRE (0.018")**
- **STAGE III ARCH WIRE - UPPER (0.020"), LOWER (0.018")**
- **UPRIGHTING SPRING (RIGHT AND LEFT) (0.0 14") (CANINE AND PREMOLAR)**
- **ROTATION CORRECTION SPRING (0.020")**
- **SEPARATING SPRING (0.018")**
- **BREAKING AUXLARY (0.014")**
- **Two SPUR BEGG ARCH (0.014")**
- **FOUR SPUR BEGG ARCH (0.014")**
- **RECTANGULAR WIRE EXERCISES**
- **IDEAL ARCH B0NWILL-HAWLEY (SS 16x22)**
- **PLACEMENT OF 1ST ORDER BENDS (SS 16x22)**
- **PLACEMENT OF 2ND ORDER BENDS (SS16x22) PLACEMENT OF 3RD ORDER BENDS (SS 16x22)**
- **UTILITY ARCH WIRE (SS 16x22) o PROTRACTION o RETRACTION TEAR DROP LOOP (SS 16x22) o WITH SWEEP o WITHOUT SWEEP**
- **BULL LOOP (SS 16X22)**

- **KEYHOLE LOOP (SS 16x22)- SINGLE&DOUBLE**
- **BOX LOOP (SS 16x22)**
- **T LOOP (TMA 17x25)**

7. **Soldering exercises:**

Sl.No.	Exercise	No.
1	Star/Comb/Christmas tree	1

8. **Study model preparation: As per specification of " indian board of orthodontics" standards**

9. **Model analysis – Mixed and permanent Dentition:**

10. **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 (Steiners, Mc.Namara,, Bjork, COGS, Wits, Downs, Tweeds, Ricketts, Grummons)
3	Soft tissue analysis – Holdaway and Burstone
4	Various superimposition methods

11. **Basics of Clinical Photography including Digital Photography:**

12. **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
4	**Bonding of brackets with Niti plain arch wire 17x25**
5	**Retraction mechanics — t loop and tear drop**
6	**Intrusion mechanics — k-sir and three piece**

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.

WRITING THESIS/RESEARCH PAPERS:

Attitudes including Communication Skills

A. Develop adequate communication skills particularly with the patients giving them the various options available to manage a particular Dentofacial problem and to obtain a true informed consent from them for the most appropriate treatment available at that point of time

B. Develop the ability to communicate with professional colleagues in orthodontics or other specialities through various media like correspondence, internet, e-video, conference, etc. To render the best possible treatment

Training in Research Methodology, Biostatistics, Ethics / Bioethics in Dentistry, Jurisprudence and Audits All MDS candidates shall compulsorily attend the Research Methodology Workshop conducted by the University within 6 months from the date of joining the course. In this regard, the candidates will be issued a completion Certificate by the University.

EVERY POST GRADUATE STUDENT MUST UNDERGO A TRAINING IN RESEARCH METHODOLOGY, BIOSTATISTICS, ETHICS, BIOETHICS IN RESEARCH, JURISPRUDENCE AND AUDITS, WITHIN THE FIRST SIX MONTHS OF COURSE, WHICH WILL HELP THEM TO DECIDE THEIR DISSERTATION TOPIC AND METHODOLOGY

Health Informatics ¨C usage of Information technology (Computer) STUDENTS SHOULD BE MADE WELL FAMILIAR WITH THE REQUIRED COMPUTER AND INFORMATICS SKILLS .

(a) LECTURES:

There shall be some didactic lectures in the speciality and in the allied fields. The departments shall encourage guest lectures in the required areas and integrated lectures by multi-disciplinary teams on selected topics, to strengthen the training programmes.

(b) JOURNAL REVIEW:

The journal review meetings shall be held at least once a week. All trainees, associate and staff associated with the post-graduate programme are expected to participate actively and enter relevant details in the logbook. The trainee shall make presentations from the allotted journals of selected articles.

(c) SEMINARS:

The seminars shall be held at least twice a week in each department. All trainees are expected to participate actively and enter relevant details in logbook.

(d) SYMPOSIUM:

It is recommended to hold symposium on topics covering multiple disciplines.

(e) CLINICAL POSTINGS:

Each trainee shall work in the clinics on regular basis to acquire adequate professional skills and competency in managing various cases.

(f) CLINICO-PATHOLOGICAL CONFERENCE:

The clinico pathological conference shall be held once a month involving the faculties of Oral Medicine and Radiology, Oral Pathology and allied clinical departments. The trainees shall be encouraged to present the clinical details, radiological and histo-pathological interpretations and participation in the discussions.

(g) INTER-DEPARTMENTAL MEETINGS:

To encourage integration among various specialities, there shall be inter-departmental meeting chaired by the Dean with all heads of post-graduate departments at least once a month.

(h) TEACHING SKILLS:

All the trainees shall be encourages to take part in undergraduate teaching programmes either in the form of lectures or group discussion.

(i) DENTAL EDUCATION PROGRAMMES:

Each department shall organise dental education programmes on regular basis involving other institutions. The trainees shall also be encouraged to attend such programmes conducted outside their university or institute.

(j) CONFERENCES/WORKSHOPS/ADVANCED COURSES:

The trainees shall be encouraged to attend conference/workshops/advanced courses and also to present at least two scientific papers and two posters at State/national level speciality and allied conferences/conventions during the training period.

(k) ROTATION AND POSTING IN OTHER DEPARTMENTS:

To bring in more integration among the specialities and allied fields, each department shall workout a programme to rotate the trainees in related disciplines.

STRUCTURED TRAINING PROGRAMME

(a) Journal Clubs 5 in a year
(b) Seminars 5 in a year
(c) Clinical Case Presentations 4 in a year
(d) Lectures taken for undergraduates1 in a year
(e) Scientific Paper / Poster Presentations In State /National Level Conferences 4 papers/posters during three years of training workshop period
(f) Clinico Pathological Conferences 2 presentations during three years of training period
(g) Scientific Publications (optional) one publication in any indexed scientific journal
(h) Submission of Synopsis one synopsis within six months from the date of commencement of the course
(i) Submission of Dissertation months one dissertation within six months before appearing for the University examination
(j) Submission of Library Dissertation one dissertation within eighteen months from the date of commencement

DISSERTATION:

Every candidate appearing for the post-graduate degree examination shall at least six months prior to the examinations, submit with his form for examination, four typewritten copies of the dissertation undertaken by the candidate, prepared under the direction and guidance of his/her guide.

It must be approved by the Institutional Review Board consisting of Principal, all the HOD's, an advocate, medical specialties and social worker within the first six months after the commencement of the course. The application for registration of dissertation topic must be sent through the Principal duly forwarded by the Professor/ HOD. The University will register such dissertation topic. In case the students want to change the topic of dissertation, they cando it within the next three months. No change in the Guide/dissertation topic shall be made without prior approval of the University.

The aim of dissertation is to train a postgraduate student in research methodology. It includes identification of a problem with recent advances, designing of research study on collection of data, practical analysis and comparison of results and drawing conclusions

The dissertation should be written under the following headings.

Introduction /Aims and objective/Review and literature/Materials & Methods/Results/Discussion

Conclusion/Summary

The written text of dissertation shall not be less than 100pages. It should be neatly typed in double line spacing on one side (A4 size, 8. 27"x 11.69") and bounded properly. Photos, charts, tables, tables and graphs can be attached where ever necessary. Spiral binding should not be used. The dissertation shall be certified by the Guide and Head of the department and forwarded by the Principal to the University.

The dissertation so submitted shall be referred to the examiners for their examination and acceptance of it shall be a condition precedent to allow the candidate to appear for the written part of the examination.

Provided that a candidate whose dissertation has been accepted by the examiner, but declared failed at the examination, shall be permitted to re-appear at the subsequent examination without a new dissertation.

Provided further that if the dissertation is rejected by the examiner, the examiner shall assign reasons thereof with suggestions for its improvement to the candidate and such candidate shall re-submit his/ her dissertation to the examiner who shall accept it before appearing in the examination.

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.

REFERENCE BOOKS:

1) Dentofacial orthopedics with functional appliances by thomas m graber thomas rakosi alexander g petrovic
2) Orthodontics - current principles and techniques by lee w graber robert vanersdall jr katherine vig greg j huang
3) Esthetics and biomechanics in orthodontics by ravindran nanda
4) Orthodontic diagnosis by thomas rakosi irmtrud jones thomas graber
5) Contemporary orthodontics by william r proffit henry fields david sarver
6) Twin block functional therapy - application in dentofacial orthopedics by william j clark
7) Systematised orthodontic by mclaughlin bennett trevisi
8) Contemporary treatment of dentofacial deformity by william r proffit raymond p white david m sarver
9) Facial growth -by donald h.enlow
10) Dentofacial deformities- bruce n.epker, john paul stella and leward c.fish.
11) The biomechanical foundation of clinical orthodontics - charles j burstone and kwangchul choy.
12) Self ligation in orthodontics - nikolaos pandis and theodore eliades

JOURNALS:

1) American Journal of Orthodontics and dentofacial orthopedics
2) Seminars in orthodontics
3) Journal of clinical orthodontics
4) World journal of orthodontics
5 Australian journal of orthodontics
6) Journal of Indian Orthodontic Society
7) Angle orthodontist
8) Journal of dental research
9) European journal of orthodontics
10) Cleft palate craniofacial journal
11) British journal of plastic surgery