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

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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1. GENERAL ANATOMY INCLUDING EMBRYOLOGY AND HISTOLOGY

1. **GOAL**

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

2. **OBJECTIVES**

a. KNOWLEDGE AND UNDERSTANDING:

At the end of the first BDS in anatomical science the undergraduate student is expected to

i. Know the normal disposition of the structures in the body while clinically examining a Patient and while conducting the clinical procedures
ii. Know the anatomical basis of disease and injury
iii. Know the microscopic structure of the various tissues, a prerequisite for understanding the disease process.
iv. Know the nervous system to locate the site of lesion according to the sensory and or the motor deficits encountered
v. Have an idea about the basis of the abnormal development, critical stages of development, effects of teratogens, genetic mutations and environmental hazards
vi. Know the sectional anatomy of the head and neck and brain to read the features in the Radiographs and the picture taken by modern technique
vii. Know the anatomy of cardiopulmonary resuscitation

b. SKILLS:

i. To locate various structure of the body and to mark the topography of the living anatomy
ii. To identify various tissues under microscope
iii. To identify the features in radiography and modern imaging techniques.
iv. To detect various congenital abnormalities.

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:

By emphasizing on the relevant information the anatomy taught integrally with other basic sciences and clinical subjects not only keeps the learner curious but also lays down the scientific foundation for making a better doctor, a benefit to the society. This insight is gained in a variety of ways:

1) Lectures and small group teachings
2) Demonstrations
3) Dissection of human cadavers
4) Study of dissected specimens
5) Osteology
6) Study of histology slides
7) Audio visual aids
8) Charts and models for embryology and genetics

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) Anti virus 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 -100 hrs
Practical Hours -175 hrs
Total -275 hrs

5. **TEACHING METHODOLOGY**

- Combination of Lectures
- Small group seminars, tutorials
- Dissection and learning from dissected specimens
- Microscopic demonstration
- Audio visual aids
- Demonstration of articulated and individual bone specimens.
- Use of workbook for practical classes
- Drawing histology diagrams in record notebook
- Surface anatomy on living individual
- Study of radiographs & other modern imaging techniques.
- Study of Histology slides.
- Study of embryology models.

6**. THEORY SYLLABUS**

TOPIC	**MUST KNOW**	**DESIRABLE TO KNOW**	**NICE TO KNOW**
Anatomical terminology	An understanding of the various subdivisions of anatomy ♣Anatomical position ♣Anatomical planes ♣Terms of direction, relation, comparison, laterality & movement		
Introduction to bones	Composition of bone and bone marrow ♣Regional classification of skeleton ♣Structural classification of bone a. Distribution of spongy and compact bone in the body		Laws of ossification, including direction of nutrient foramen and the growing end of the

	♣Classification of bone according to shape ♣Classification of bone based on ossification ♣Parts of a long bone ♣Blood and nerve supply of a long bone ♣Special features of a sesamoid bone		bone ♣Exceptions to the laws of ossification
Introduction to joints	Definition Classification according to a. Structure- with subtypes and examples of fibrous, cartilaginous and synovial joints b. Mobility c. Axes of movement ♣Complex and compound joints ♣Nerve supply of joints- Hilton's law Blood supply of joints		
Introduction to the muscular system	Structural classification of muscle ♣Parts of a skeletal muscle Differentiate tendon and aponeurosis ♣General principles about how attachments of muscles affect the joints they cross ♣Classification of muscle according to action (agonists, antagonists, synergists, fixators)		Classification of muscle according to direction of muscle fibres and shape
Introduction to the cardiovascular system	Classification into blood vascular system ♣Differentiate pulmonary and systemic circulation ♣Layers of any blood vessel ♣Types of blood vessels a. General differences between arteries and veins b. Functional difference between elastic, muscular arteries and arterioles c. Function of meta-arterioles, precapillary sphincters, arterio-venous anastomoses d. Microvasculature-types of capillaries and their functional significance		Concepts of thrombosis, infarction, aneurysm ♣Concept of lymphoedema and spread of tumors via lymphatics and venous system

	♣Venous return a. Musculo-venous pumps b. Role of valves ♣Definition and structure of a portal system		
Lymphatic system	Components and function of the lymphatic system a. Structure of lymph capillaries b. Concept that lymphatics accompany blood vessels c. Concept that lymph ultimately drains into the venous system d. Function of lymph nodes in the lymphatic system		
Nervous system	Subdivisions of nervous system into Central and peripheral nervous system, somatic and autonomic nervous system Structure and classification of neuron		
Respiratory system	Trachea, pleura and Lungs		
Gastrointestinal system Accessory organs of digestion	Name, position, external and internal features, important peritoneal and other relations, blood supply, nerve supply, lymphatic drainage and applied aspects of: Spleen, Abdominal part of esophagus Stomach, Liver & its vascular segments Gall bladder, Pancreas, Small intestines Caecum, Appendix, Colon, Extrahepatic bilary apparatus		
Urinary system	Kidneys, Ureter Suprarenals , Urinary bladder		
Genital system	Testis, Ovary, Uterus, Fallopian tube		
Introduction	Terms used in embryology Stages of development		
Mitosis and Meiosis and	Primordial germ cells Concept of Chromosomal abnormalities		
Gametogenesis	Oogenesis Spermatogenesis		
Uterine and ovarian cycles	Uterine and ovarian cycles Ovulation		
Fertilization	Definition, Phases of fertilization, Results of fertilization		

and Blastocyst			
Bilaminar germ disc	Implantation Abnormal implantation		
Trilaminar germ disc	Gastrulation		
Embryonic period	Definition, Neurulation – neural pores and the time of closure, Derivatives of each of the 3 germ layers, Somites		
Fetal membranes and Placenta	Structure, Placental circulation, Function, Placental barrier		
Amnion and umbilical cord	Structure and function	Amniotic fluid- hydramnios and oligohydramnios	
Birth defects	Face Palate Tongue Branchial apparatus Pituitary gland Thyroid gland Eye		Types of abnormalities- malformation, disruption, deformation, syndrome, Teratogens
			Facial clefts, First Arch Anomalies, Developmental anomalies of tongue, Branchial cysts and fistulae, Ectopic thymic, parathyroid or thyroid tissue, Thyroglossal cyst
Chromosomes	Structure of chromosomes Classification of chromosomes based on position of centromere		
Karyotyping	Technique of preparing a Karyotype Types of banding		

	♣Clinical applications of karyotyping ♣Reading of karyotypes for normal male, female, Trisomies, Turner syndrome, Klinefelter syndrome		
Osteology	Anatomical position of skull Identification and locations of individual skull bones in an articulated skull ♣Features seen in Normas frontalis, verticalis, occipitalis, lateralis and basalis ♣Cranial cavity- subdivisions, foraminae and structures passing through them ♣Details of Mandible and Maxilla, ♣Features of typical and atypical cervical vertebrae		Concept of bones which ossify in membranes and cartilage ♣Frankfort Plane ♣Parietal, Occipital, Frontal and Temporal bones ♣Sphenoid,
Scalp	Layers of scalp, Extent/ attachment of each layer, Surgical importance of each layer, Blood supply, nerve supply and lymphatic drainage		
Superficial dissection of the face	Muscles of facial expression Muscle groups acting upon the angle of the mouth - Attachments of the orbicularis oculi, orbicularis oris and buccinator muscles only ♣Sensory innervation of the face		Names of the superficial muscles in the face, with their actions and nerve supply
Deep dissection of the face	Facial artery: Origin, course and branches ♣Facial vein: Formation, course and tributaries ♣Facial nerve: Branches in the face ♣Lymphatic drainage of the face ♣Surgical importance of the deep facial vein		
Parotid Region	Parts, borders, surfaces, contents, relations and nerve supply of parotid gland ♣Course of parotid duct		Parotid abscess ♣Plane of dissection and main complication of superficial parotidectomy
The side of the	Boundaries and subdivisions of posterior triangle		

neck Posterior Triangle	♣Boundaries and contents of the subclavian and occipital triangles ♣Special emphasis on with nerve supply and actions ♣Sternocleidomastoid with attachments and relations, Wry neck Lymphatic drainage of head and neck		
Dissection of back	Contents of the vertebral canal Suboccipital triangle Boundaries and contents ♣Position, direction of fibres, relations, nerve supply, actions of: Semispinalis capitis, Splenius capitis		
Cranial Cavity	Cranial fossae: structures related and major foramina and structures passing through Dural venous sinuses ♣Pituitary gland	Pituitary tumours	Clinical importance of dural venous sinuses
Orbit	Attachments, nerve supply and actions of muscles of eyeball ♣Nerves and vessels in the orbit ♣Ciliary ganglion		
Anterior Triangle	Boundaries and subdivisions of the anterior triangle ♣Boundaries and contents of the muscular, carotid, digastric and submental triangles		
Cranial nerves	extra cranial course 5th, 7th and 9th nerves and upper Cervical nerves.		
Temporal and Infratemporal regions	Extent, boundaries and contents of temporal and infratemporal fossae ♣Attachments, direction of fibres, nerve supply and actions of muscles of mastication Temporomandibular joint		Dislocation of temporomandibular joint
Submandibular region	Parts, borders, surfaces, relations, nerve supply of submandibular gland ♣Course and relations of submandibular duct ♣Submandibular ganglion ♣Position, relations and nerve supply of sublingual gland		Bidigital palpability of submandibular swelling
Deep	Thyroid gland- location, parts, borders, surfaces, relations,	Thyroid	Vagus Nerve in the

structures in the neck	blood supply ♣Parathyroid glands- location, blood supply ♣Trachea, Tracheostomy- structures encountered ♣Subclavian artery- Origin, parts, course, branchs	swellings - anatomically relevant clinical features ♣Awareness of liability of injury to external and recurrent laryngeal nerves during thyroidectomy	neck- Course and branches ♣Accessory Nerve- Course and supply ♣Cervical Sympathetic chain- Components, branches, area of supply ♣Deep cervical fascia- parts, extent, attachments, modifications Deep cervical lymph nodes
Mouth, Pharynx, Palate	♣Names, position, actions and nerve supply of muscles of palate and pharynx ♣Palatine tonsil- Position, relations, blood supply ♣Waldeyer's lymphatic ring- Components and their function ♣Boundaries and clinical significance of pyriform fossa	Killian's dehiscence	Tonsillitis and tonsillectomy ♣Adenoids ♣Paratonsillar absc
Cavity of Nose	♣Nasal septum Epistaxis- significance of Little's area ♣Lateral wall of nasal cavity ♣Paranasal sinuses concept of referred pain		Sinusitis Maxillary sinus tumours
Larynx	Names, nerve supply and actions of intrinsic and extrinsic muscles of larynx Cartilages and ligaments ♣Sensory innervation and blood supply of larynx		Recurrent laryngeal nerve injury
Tongue	Names, nerve supply and actions of extrinsic and intrinsic muscles of tongue ♣Nerve supply and lymphatic drainage of tongue		Hypoglossal nerve palsy
Organs of hearing and	Parts, boundaries, contents, relations, blood supply and nerve supply of external ear, middle ear and Auditory tube		

equilibrium			
Eyeball	Parts and layers of eye ball		
Prevertebral region and Joints of Head and neck	Atlanto-occipital joint		
External features	External features of the brain and spinal cord and its meningeal coverings and blood supply		
Spinal cord	a) External and internal features b) Organization of grey matter into nuclei c) Coverings of spinal cord d) Ascending and descending tracts and their functions e) Upper and lower motor neurons f) Spinal segment and dermatome g) Blood supply h) Modifications of piamater		
Brainstem	External and internal features		
Cerebellum	Gross features and subdivisions of cerebellum. Deep nuclei, afferent and efferent connections. Cerebellar peduncles		Morphological subdivisions of cerebellum into archi, paleo and neocerebellum, Cerebello-pontine angle tumour, symptoms of cerebellar disease
Cerebrum	Gross features (gyri and sulci) of the cerebral hemisphere – superolateral, Medial and inferior surface, and the subdivisions into lobes, and blood supply. Functional areas and Brodmann's numerals (motor, sensory, visual, auditory, speech, frontal eye field, prefrontal cortex)		

	Horizontal section of cerebrum Midsagittal section of cerebrum		
White fibres of cerebrum	Association, commissural and projection fibres		
Ventricles of the brain	Features of lateral, third and fourth ventricle. Choroid plexus, Circulation of Cerebro-Spinal Fluid (CSF)		
Blood supply of brain and spinal cord	Blood supply of brain and spinal cord		

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 HOURS**

- Osteology - 30 hrs
- Organ Demonstration - 5 hrs
- Histology-Slide Demonstration - 30 hrs
- Demonstration of dissected specimens
  Head and Neck and Brain -110 hrs

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175 hrs

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

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

Total= 70 Marks

Note : Write Notes On: one question should be from Histology and one from embryology.

9. PRACTICAL EXAMINATION

SPOTTERS : 90 MARKS (45X2=90 marks)

Gross anatomy (head & neck, neuroanatomy) 20 X 2 = 40 Marks
Histology spotters 15 X 2 = 30 Marks
Osteology (5),embryology (4), genetics(1 chart) 10 X 2 = 20 Marks

Total 45 spotters: 45 X 2 = 90 Marks

Criteria to be followed during Anatomy practical examination:
One minute to be given for identification and writing the answers for each spotter Identification of microscopic tissue and any two most relevant points for identification should be mentioned for histology spotters For other spotters two points per spotter to be answered.

VIVA VOCE -20 MARKS
Osteology-10 marks, Embryology -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 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 - 10 Marks
Practical - 10 Marks
Total – 20 Marks

Topics for each assessment:

General anatomy, embryology (concerned), histology (concerned), Head and neck portions and osteology. Model exam at the end

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**:
Gross Anatomy
1. Cunningham's Manual of Practical Anatomy Volumes 1, 2 and 3 15th edition by GJ Romanes
2. Clinical Oriented Anatomy 7th edition by Moore KL, Agur AMR and Dalley AF
3. Textbook human anatomy(Head and Neck), Inderbir singh
4. A Textbook of Human Anatomy, 2000 by T.S. Ranganathan

Neuroanatomy
1. Clinical Neuroanatomy 7th edition 2009 by Richard S. Snell
2. Essentials of Human Anatomy Neuroanatomy 4th edition 2012 by AK Datta
3. Textbook of Clinical Neuroanatomy 2nd edition Vishram Singh
4. Illustrated Textbook of Neuroanatomy 12th edition by GP Pal

Histology
1. Inderbir Singh's Textbook of Human Histology with Colour Atlas and Practical Guide 7th edition, 2014 by Vasudeva Neelam
2. Wheater's Functional Histology: A Text and Colour Atlas, 6th Edition by Barbara Young, Geraldine O'Dowd, Phillip Woodford
3. Textbook of Histology 2008 by GP Pal

Embryology
1. Langman's Medical Embryology 13th edition by T.W. Sadler,

2. Larsen's Human Embryology 5th Edition 2014 by Schoenwolf, Bleyl, Brauer and Francis-West
3. The Developing Human: Clinically Oriented Embryology 9th edition, 2012 by Keith L. Moore
4. Human Embryology 10th edition by IB Singh

13. REFERENCE BOOKS

1. Gray's Anatomy 41st Edition 2016 Standring S
2. Emery Medical Genetics
3. SNELL (Richard S.) Clinical Anatomy for Medical Students, Ed. 5, Little Brown & company, Boston.
4. RJ LAST'S Anatomy- McMinn, 9th edition.
5. ROMANES(G.J.) Cunningham Manual of Practical Anatomy: Head & Neck & Brain Ed.15. VOL. III, Oxford Medical Publication.
6. WHEATER, BURKITT & DANIELS, Functional Histology, Ed. 2, Churchill Livingstone.
7. SADLER, LANGMAN'S, Medicals Embryology, Ed.6.
8. JAMES E ANDERSON, Grant's Atlas of Anatomy, Williams & Wilkins.
9. WILLIAMS, Gray's Anatomy, Ed.38. , Churchill Livingstone.

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.

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.

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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
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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
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- 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.

3. DENTAL ANATOMY, EMBRYOLOGY AND ORAL HISTOLOGY

1. **GOAL**

To produce a dental graduate and clinician who is competent in examining, understanding and treating common oral disorders/diseases, alleviate pain, swelling, stomatodynia, stomatopyrosis, dysphagia and dysarthrosis using the best available evidence as per current knowledge and understanding of common oral diseases process; to employ reliable diagnostic modalities including but not limited to radiology, sialogram and to refer to a competent specialist in case of oral diseases with uncommon presentations, signs and symptoms.

2. **OBJECTIVES**

KNOWLEDGE AND UNDERSTANDING:

- To acquire an understanding of how cells, tissues, and organs develop and function in order to gain a clear perspective of these structures as a basis for understanding oral biology/ecology
- To develop a comprehension of the principles of embryogenesis and human development with emphasis on the face and structures of the oral cavity
- To understand, comprehend, describe, compare, and illustrate the histologic characteristics of oral tissues in health and diseased states
- To develop a professional vocabulary of terminology related to the head and neck, the oral complex, and the teeth so as to apply in clinical scenario
- To identify, locate, and relate the gross anatomical structures of the head and neck to include various teeth, the bones of the skull, musculature, major nerves, glands and the circulatory and lymphatic systems.
- To identify the histologic and anatomic features of the extra-oral and intraoral structures.
- To compare and contrast the human dentition in relationship to location, function, and morphology
- To identify, comprehend, describe the sequence and eruption patterns of primary and permanent teeth and their implications on future oral and overall health
- To understand the oral physiology, unique biochemical basis behind of oral musculature, glands and movements
- To be able to clinically apply and incorporate knowledge of tooth morphology, dental occlusion, head and neck anatomy, histology, and embryology into patient assessment, preventive management, treatment planning, and patient education in future

SKILLS:

- Able to carve and reproduce the morphology of human permanent teeth in wax blocks
- Able to identify different oral hard tissues in clinical situations
- Able to differentiate normal from abnormal and diseased states
- Able to identify various types of human teeth based on their morphology
- Able to appreciate the influence of age, gender and race on oral and para-oral structures
- Able to locate the different areas/surfaces of the teeth
- Able to understand the implications of the disease process and ageing on normal oral structures
- Able to appreciate the eruption and shedding pattern of human teeth
- Able to appreciate and integrate the concept of occlusion, range of human jaw movements in preclinical and clinical situations
- Able to use effectively the terminologies and anatomical terms for clinical and patient communications

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 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. 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

vi. Competencies specific to the subject

To gain knowledge about the microscopic configuration of normal histological structure of both soft and hard tissues.

4. **TEACHING HOURS**

Lecture hours – 105 hours
Practical/clinical hours – 250 hours

5. **TEACHING METHODOLOGY**

I. LECTURE
II. DEMONSTRATION
III. GROUP DISCUSSION
IV. SEMINAR PRESENTATION BY THE STUDENTS

6. **THEORY SYLLABUS**

TOPIC	MUST KNOW	DESIRABLE TO KNOW	NICE TO KNOW
Introduction to tooth morphology	➢ Human dentition : types and functions ➢ Notation systems : Palmer's, FDI system, Universal and Victor-Haderup system ➢ Tooth surfaces, their junctions – line angles and point angles ➢ Definition in terms used in dental morphology Contact areas and embrasures – clinical significance	➢ Dental formula	Evolution of human dentition
Morphology of permanent teeth	➢ Description of individual teeth, along with their endodontic anatomy and including a note on their chronology of development, differences between similar classes of teeth and identification of individual teeth. ➢ Variations and anomalies commonly seen in individual teeth.		
Morphology of deciduous teeth	➢ Difference between deciduous and permanent teeth ➢ Description of individual deciduous teeth, including their chronology and development ➢ Differences between deciduous and permanent dentition	Endodontic anatomy	

	➢ Identification of individual deciduous teeth		
Occlusion	➢ Definition, factors influencing occlusion – basal bon, arch, individual teeth, external and internal forces and sequence of eruption	➢ Inclination of individual teeth – compensatory curves ➢ Centric relation and centric occlusion – protrusive, retrusive and lateral occlusion	➢ Introduction to and classification of malocclusion ➢ Clinical significance of normal occlusion
ORAL EMBRYOLOGY	Brief review of development of face, jaws, lips, palate and tongue with applied aspect		
Development of teeth	➢ Epithelial mesenchymal interaction, ➢ Detailed study of different stages of development of crown, root and supporting tissue of teeth and detailed study of formation of calcified tissues. ➢ Applied aspects of disorders in development of teeth.	Deviation or aberration in tooth formation	Exposure to microscopic slides
Eruption of deciduous and permanent teeth	➢ Mechanisms in tooth eruption ➢ Theories and histology of eruption, formation of Dentogingival junction, role of gubernacular chord in eruption of permanent teeth. Clinical or applied aspect of disorders of eruption.	Physiological tooth movement – Preeruptive, Eruptive and Posteruptive tooth movements	
Shedding of teeth	➢ Factors and mechanism of shedding of deciduous teeth ➢ Complications of shedding	Root resorption and resorptive cell	

ORAL HISTOLOGY Enamel	Detailed microscopic study	Age changes	➢ Fluoride applications ➢ Etching ➢ Clinical and forensic significance
Dentin	➢ Detailed microscopic study ➢ Dentin hypersensitivity ➢ Reaction of pulp tissue to varying insults on exposed dentin		➢ Clinical and forensic significance
Cementum	Detailed microscopic study	➢ Hypercementosis ➢ Repair	Clinical and forensic significace
Pulp	➢ Detailed microscopic study ➢ Functions ➢ Age changes and Pulp calcification	Pulp anatomy – pulp cavity, pulp chamber, pulp horn, pulp canal, apical and lateral foramen	Clinical significance
Periodontal ligament and Alveolar bone	➢ Detailed microscopic study ➢ Functions ➢ Age changes	Histological changes in periodontal ligament and bone in normal and orthodontic tooth movement	➢ Applied aspects of alveolar bone resorption
Oral mucosa	➢ Detailed microscopic study ➢ Variation in structure in relation to functional requirements ➢ Mechanisms of keratinisation ➢ Clinical parts of gingiva ➢ Dentogingival and Mucocutaenous junctions ➢ Lingual papillae	Age changes and clinical considerations	

Salivary glands	➢ Detailed microscopic study of acini and ductal system. ➢ Age changes and clinical considerations.		
TM Joint	➢ Review of basic anatomical aspects, microscopic study and clinical considerations.		
ORAL PHYSIOLOGY • Saliva	➢ Composition of saliva – variations, formation of saliva ➢ Functions ➢ Role of saliva in dental caries and applied aspects of hyper and hypo salivation.	Mechanism of secretion, salivary reflexes, brief review of secretomotor pathway	
• Mastication	Peculiarities of masticatory muscles	Masticatory cycle, masticatory reflex and neural control of mastication	Masticatory force and its measurement, need of mastication
• Deglutition	➢ Stages of deglutition, swallow in infants	neural control of deglutition and dysphagia	
• Calcium, phosphorous and fluoride metabolism	Source, requirements, absorption, distribution, function and excretion, clinical considerations	hypocalcemia and hypercalcemia, hyper-phosphatemia and hypophosphatemia and fluorosis	
• Theories of mineralisation	Definition, mechanism, theories and their drawbacks	Applied aspects of physiology of mineralisation	Pathological considerations – calculus formation
• Physiology of taste	Innervation of taste buds and taste pathway,	Physiological basis of taste sensation, age changes	Applied aspects – taste disorders

• Physiology of speech		➢ Review of basic anatomy of larynx and vocal chords	➢ Voice production, resonators, production of vowels and different consonants – role of palate, teeth and tongue. Effects of dental prosthesis and appliances of speech and basic speech disorders

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. Cadaver ethics.

7. PRACTICALS:

Drawing and wax carving of permanent tooth except maxillary second, mandibular first, maxillary second and third molars. Microscopic study of tooth germ, enamel, dentin, pulp, cementum, periodontal ligament, alveolar bone, salivary glands and oral mucosa including papillae and taste buds.

8. THEORY EXAMINATION (3 Hours)

I. Elaborate on : 2 x 10 = 20 marks
II. Write Notes on:10 x 5 = 50 marks

70 marks

9. PRACTICAL / CLINICAL EXAMINATIONS

Scheme for practical examination–spotters/carving/microscopic identification of slides - 90 marks.

Carving - 30 Marks
Spotters and microscopic identification of slides - 60 Marks.

Total - 90 Marks

Viva – 20 marks

Viva – emphasis on tooth numbering systems, chronology of eruption, nerve and blood supply, mechanism of dental pain and dentine sensitivity, calcium and phosphate metabolism, bone, shedding and eruption of teeth with molecular basis.

	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 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 - 10 Marks
Practicals - 10 Marks
Total - 20 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) Recommended books (Orban's Oral histology & embryology) and (Wheeler's Dental anatomy, physiology and occlusion). Suggested books (Ten Cate's Oral Histology).
(ii) Orban's oral histology and embryology – S.N. Bhaskar 10thEd
(iii) Ten Cate's Oral histology _A Nanci 8th ed
(iv) Oral development and histology – James and Avery
(v) Wheeler's dental anatomy, physiology and occlusion – Major.M. Ash
(vi) Dental anatomy -its relevance to dentistry – Woelfel and Scheid
(vii) Applied physiology of mouth – Lavelle
(viii) Physiology and biochemistry of mouth - Jenkins

13. REFERENCE BOOKS :

(i) Fundamentals of Oral Histology and Physiology.
(ii) Sicher and DuBrul's Oral Anatomy.
(iii) Orban's Oral Histology & Embryology – S.N.Bhaskar
(iv) Oral Development & Histology - James & Avery
(v) Wheeler's Dental Anatomy, physiology & Occlusion – Major.M.Ash
(vi) Dental Anatomy – its relevance to dentistry – Woelfel & Scheid
(vii) Applied Physiology of the mouth – Lavelle
(viii) Physiology & Biochemistry of the mouth - Jenkins

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

5. GENERAL AND DENTAL PHARMACOLOGY AND THERAPEUTICS

1. **GOAL**

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

2. **OBJECTIVES**

a) KNOWLEDGE AND UNDERSTANDING:

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

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

b) SKILLS:

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

i. Prescribe drugs for common medical and dental ailments.
ii. Appreciate adverse reactions and drug interactions of commonly used drugs
iii. Observe experiments designed for study of effects of drugs.
iv. Critically evaluate drug formulations and be able to interpret the clinical pharmacology of marketed preparations commonly used in dentistry.

c) ATTITUDE:

To develop the attitude to serve the rural community

d) INTEGRATION:

Practical knowledge of use of drugs in clinical practice will be acquired through integrated teaching 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

4. **TEACHING HOURS**

Lecture hours - 70 hours
Practical hours- 20 hours
Total – 90 hours

5. **TEACHING METHODOLOGY**

The objectives of teaching 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**

- New drug development- clinical trials, biomedical ethics;
- Pharmacoeconomics;
- Pharmacovigilance

SYSTEMIC PHARMACOLOGY

TOPIC	MUST KNOW	DESIRABLE TO KNOW	NICE TO KNOW
1.	GENERAL PHARMACOLOGY	DRUGS ACTING ON CARDIOVASCULAR SYSTEM	VITAMINS: Water soluble vitamins, vitamin D, vitamin K, vitamin E, implications of vitamins in clinical dentistry.
2.	ANTIBIOTICS	DRUGS ACTING ON CENTRAL NERVOUS SYSTEM	VACCINES
3.	NSAIDS	DIURETICS	
4.	DRUGS ACTING ON GI TRACT	DRUGS ACTING ON BLOOD	
5.	LOCAL ANESTHETICS	GENERAL ANESTHETICS	
6.	DRUGS ACTING ON AUTONOMIC NERVOUS SYSTEM	ANTINEOPLASTIC AGENTS	
7.	INSULIN AND ORAL HYPOGLYCAEMIC DRUGS		
8.	CORTICOSTEROIDS		
9.	ANTISEPTICS AND DISINFECTANTS		

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 and demonstrations:
To familiarize the student with prescription writing and dispensing. Rational of drug combinations of marketed drugs

8. **THEORY EXAMINATION**

Elaborate on 2x10= 20 marks
Write notes 10x5 = 50 marks
Total = 70 marks

9. PRACTICAL EXAMINATION

Dispensing pharmacy 2x25= 50 marks
Prescription 2x10= 20 marks
OSPE 2x 10=20 marks
Total 90 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 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 10 marks
Practicals 10 marks
Total 20 marks

Topics for Internal Assessment
i. General Pharmacology
ii. Autonomic Nervous system
iii.Cental Nervous system
iv.Cardiovascular system
v. Respiratory system,Gastrointestinal system,autocoids
vi. Hormones
vii.Chemotherapy

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. Tripathi K D – Essentials of medical pharmacology
ii. R S Satoskar- Pharmacology and Pharmacotherapeutics
iii. Bertam G Katzung- Basic and clinical pharmacology

13. REFERENCE BOOKS

i. Goodman and Gilman- The Pharmacological basis of Therapeutics.
ii. R.S.Satoskar, Kale Bhandarkar's Pharmacology and Pharmacotherapentics, 10th Edition, Bombay Popular Prakashan 1991.
iii. Bertam G Katzung, basic and Clinical pharmacology 6th ed.Appleton & Lange 1997.
iv. Lauerence D.R. Clinical Pharmacology 8th ed. Churchill Livingstone 1997.
v. Satoskar R.S. & Bhandarkar S.D., Pharmacology and Pharmacotherapeutics part I & part ii, 13th Popular Prakashan Bombay 1993.
vi. Tripathi K.D., Essentials of Medicla Pharmacology 4th ed Jaypee Brothers 1999.

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
   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**

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.

	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,	

	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.

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		

	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:

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

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.

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    c. Reliable and consistent access to the internet
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    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
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

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

11. ORAL PATHOLOGY AND ORAL MICROBIOLOGY

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**

The objectives are dealt as UNDER three headings (a) Knowledge and Understanding (b) Skills and (c) Attitudes.

a. KNOWLEDGE AND UNDERSTANDING:

- 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 data.
- 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.
- 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.
- Adequate clinical experience required for general dental practice
- Adequate knowledge of the constitution, biological function and behavior 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. SKILLS:

A graduate should be able to demonstrate the following skills necessary for practice of dentistry.

- 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.

- Prevent and manage complications if encountered while carrying out various surgical and other procedures.
- Carry out certain investigative procedures and ability to interpret laboratory findings.
- Promote oral health and help prevent oral diseases where possible.
- Control pain and anxiety among the patients during dental treatment.

c. ATTITUDE:

- Willingness to apply the current knowledge of dentistry in the best interest of the patient and 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 CPED Programmes to update knowledge and professional skill from time to time.
- Help and participate in the implementation of the national oral health policy.

d. INTEGRATION:

The knowledge gained from learning core basic and clinical science in medicine and dentistry are applied in the context of Oral Pathology for the following purpose:-

- To understand the process of disease mechanism and consequential outcome.
- To interpret radiological and/or laboratory features to make reliable pathological diagnosis, and thereby, to manage human health and disease.
- In addition by integration of sound basic knowledge into clinical practice will enable students to develop and advance their skills for the betterment of patient care by applying scientific method either for critical appraisal of evidence based medicine or to pursue independent research relevant to medical/dental practice.

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**

a) Lecture Hours – 25 hours (2nd BDS)
120 hours (3rd BDS)

Total 145 hours

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b) Practical/clinicalhours–50 hours (2nd BDS)
80 hours (3rd BDS)

Total 130 hours

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5. **TEACHING METHODOLOGY**

i. Class room lecture
ii. Slide demonstration
iii. Tutorials
iv. Problem-solving

6. **THEORY SYLLABUS**

TOPIC	MUST KNOW	DESIRABLE TO KNOW	NICE TO KNOW
1.Introduction:		A bird's eye view of the different pathological processes involving the oral cavity & oral cavity involvement in systemic diseases to be brought out. Interrelationship between General Medicine, General Surgery and Oral Pathology is to be emphasised.	
2.	Developmental disturbances of teeth, jaws and soft tissues of oral and paraoral region : Introduction to developmental disturbances–Hereditary, Familial mutation, Hormonal etc. causes to be highlighted.	• Developmental disturbances of teeth-Etiopathogenesis,clinical features, radiological features and histopathological features as appropriate. • The size, shape, number, structure and eruption of teeth and clinical significance of the anomalies to be emphasized. • Forensic Odontology. • Developmental disturbances of the jaws-size and shape of the jaws. • Developmental disturbances of oral and paraoral soft tissues-lip and palate-clefts, tongue, gingival, mouth, salivary glands and face	
Dental caries	- Definition - Clinical features - Clinical types	Caries preventive measures.	

	- Diagnosis - Caries microbiology Aetiopathogenesis- Theories of caries with emphasis on ecologic plaque hypothesis, specific and non-specific plaque hypothesis. •Histopathology •Immunology Complication/sequelae of dental caries.		
Pulp and periapical pathology and osteomyelitis.	• Aetiopathogenesis and their interrelationship. • Clinical features • Types of pulpitis • Microbiology • Radiology • Histopathology • Periapical diseases • Definition, classification, clinical features and diagnosis of osteomyelitis. • Sequelae of periapical abscess–summary of space infections, systemic complications and significance.		
Periodontal disease	•Aetiopathogeneis and interrelationship •Clinical features •Radiology •Microbiology •Histopathology	Basic immunological mechanisms of periodontal disease to be highlighted.	

	•Gingivitis •Desquamative gingivitis •Gingival enlargements •Periodontitis		
Microbial infection of soft tissue: Microbiology, defence mechanisms Including immunological aspects, oral manifestation, Histopathology and laboratory diagnosis of common bacterial, viral and fungal infections namely:-	BACTERIAL Tuberculosis, syphilis, ANUG and its complications, Cancrum Oris. Actinomycosis VIRAL •Herpes Simplex infections •Varicella Zoster •Measles •Mumps •Epstein-Barr virus •HIV infection FUNGAL •Relevant superficial mycosis APHTHOUSULCERS	Relevant deep mycosis	
Common non-inflammatory diseases involving jaws:		Aetiopathogenesis, clinical features, radiological and laboratory values in diagnosis of •Osteogenesis imperfecta •Rickets •Cleidocranial dysplasia •Achondroplasia •Marfan's syndrome Down's syndrome	
Diseases of TMJoint:			Ankylosis, summary of

			different types of arthritis and other developmental malformations, traumatic injuries and myofascial pain dysfunction syndrome
Cysts of oral and paraoral region. Cysts of odontogenic origin, non-odontogenic cysts, pseudocysts of jaws and soft tissue cyts of oral and paraoral region.	•Epidemiology •Classification •Histogenesis •Aetiopathogenesis •Definition •Clinicalfeatures •Radiology •Histopathology Laboratoryfeatures		
Tumors of the oral cavity	Classification of odontogenic tumors, non-odontogenic tumors and Salivary gland tumors with reference to •Epidemiology •Classification •Histo genesis •Aetiopathogenesis •Definition		

	•Clinical features •Radiology •Histopathology Laboratory features		
Odontogenic Tumors–All Lesions.			
Non – Odontogenic Tumors	Benign Epithelial •(Papilloma, Keratoacanthoma and Naevi). Malignantepithelial (Basal cell carcinoma, Verrucous Carcinoma, Squamous Cell Carcinoma and Malignant Melanoma).		
Mesenchy Mal Tumors	Benign Tumors •Fibroma •Aggressivefibrouslesions •Lipoma •Haemangioma •Lymphangioma •Neurofibroma •Schwannoma •Chondroma •Osteoma •Tori.	Malignant Tumors •Fibrosarcoma •Osteosarcoma •Giantcelltumor •Chondrosarcoma •Angiosarcoma •Kaposi sarcoma Lymphomas •Ewing's sarcoma	Others such as osteoid osteoma / osteobla stoma/ Osteochondroma.
Salivary Gland Tumors	Benign Tumors •Pleomorphic adenoma	•Oncocytoma •Warthins tumor Malignant Tumors •Adenoid cystic carcinoma •Mucoepidermoid carcinoma	•Acinic cell carcinoma Adenocarcinoma NOS.

Tumors of disputed origin		Melanotic neuroectodermal tumor of infancy Congenital epulis Granular cell myoblastoma.	
Metastatic tumors to and from oral cavity and their routes of metastasis.			General characteristics.
Fibro-osseous/Giant cell/and related lessons	•Fibrous dysplasia •Cemento-osseous dysplasia •Ossifying fibroma •Paget's disease •Central giant cell granuloma •Aneurysmal bone cyst •Cherubism Hyperparathyroidism		
Traumatic, reactive and regressive lesions of oral cavity:	•Pyogenic granuloma, exostoses, fibrous hyperplasia, traumatic ulcer and traumatic neuroma. Attrition, abrasion, erosion, bruxism, hypercementosis, dentinal changes, pulp calcifications and resorption of teeth. •Radiation effects of oral cavity, summary of physical and chemical injuries including allergic reactions of the oral cavity. Healing of oral wounds and complications–Dry socket.		

Non neoplastic salivary gland diseases.	•Definition •Classification •Epidemiology •Pathogenesis •Clinical features •Histopathology of the following:- •Sialolithiasis •Sialosis •Sialadenitis •Xerostomia •Ptyalism	•Necrotizing sialometaplasia Sjogren's syndrome.	
Systemic diseases involving oral cavity: Brief review and oral manifestations, diagnosis and significance of common blood, nutritional, hormonal and metabolic diseases of oral cavity.	•White blood cell diseases •Red blood cell diseases •Thyroid diseases •Hyperparathyroidism •Vitamin A •Vitamin B complex •Vitamin C deficiency •Vitamin D deficiency •Recurrent Apthous disease	•Progressive systemic sclerosis •Wegener's granulomatosis •Orofacial granulomatosis Sarcoidosis	
Mucocutaneous lesions.	•Lichen •planus Pemphigus •Pemphigoid •Lupus erythematosus	•Psoriasis •Scleroderma •Ectodermal dysplasia •Epidermolysis bullous White sponge nevus	

	•Erythema multiforme		
Diseases of nerves: Facial neuralgias	•Trigeminal •Glossopharyngeal •VII nerve paralysis		•Causalgia •Psychogenic facial pain Burning mouth syndrome.
Pigmentation of oral and paraoral region and discolouration of teeth.			
Diseases of maxillary sinus:		Traumatic injuries to sinus, sinusitis, cysts and tumors involving antrum.	
Oral Precancer-Cancer	Epidemiology Aetiology Clinical and Histopathological featuresTNM classification.	a) Recent advances in diagnosis, management and prevention. b)Biopsy: •Types of biopsy, •Value of biopsy, •Cytology	Histochemistry and frozen sections in diagnosis of oral diseases.
Principles of Basic Forensic Odontology.		• Introduction, definition, aims and scope. • Sex and ethnic (racial) differences in tooth morphology and histological age estimation. • Determination of sex and blood groups from buccal mucosa/saliva. • DNA methods. • Bite marks, rugae pattern and lip prints. • Dental importance of poisons and	

		corrosives. • Overview of forensic	
Bioethics	•Introduction to ethics. •Ethics of the individual. •Professional ethics.	•Research ethics. •Ethical workshop of cases.	•Gathering all scientific factors. •Gathering all value factors. •Identifying working our criteria towards decisions.
Jursiprudence	•Medical negligence and liability •Informed consent and confidentiality •Rights and duties of doctors and patients Medicaland dental ethics (as per Dentists' Act)		•Fundamentals of law and the constitution •Medical legislation and statutes (Dental and Medical Council Acts, etc) •Basics of civil law (including torts, contracts and consumer protection act) •Criminal and civil procedure code (including expert witness requirement) •Assessment and quantification of dental injuries in courts of law

7. **PRACTICALS**:

a)Procedures– Histopathological slides of relevant diseases.
b)Demonstrations– Spotters/specimens/radiographs.

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

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

Slides -------- 12 X 5 = 60 marks
Spotter ------- 6 X 5 = 30 marks
Total = 90 marks

Viva --------- 20 marks

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

10. **FORMATIVE/INTERNALASSESSMENT**

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.

Theory Internal Assessment – 10 marks
Practical Internal Assessment – 10 marks

Total 20 marks
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11. **RECORD/LOGBOOK**

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

12. **TEXTBOOKS**

i. Oral Pathology –Soames & Southam.
ii. Contemporary Oral and Maxillofacial pathology–Sapp, Eversole, Wysocki.

13. **REFERENCEBOOKS**

i. A Text Book of Oral Pathology – Shafer, Hine & Levy.
ii. Oral Pathology - Regezi & Sciubba.
iii. Oral Pathology in trophics - Prabhu, Wilson, Johnson & Daftary.
iv. Oral & Maxillofacial Pathology - Neville, Damm, Allen & Chi.
v. Medical Ethics - Francis.
vi. Oral pathology - Soames & Southam

14. **CRI POSTING SCHEDULE AND ORIENTATION**

Period of Postings
Oral Pathology & Microbiology - 15 days

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

13. PAEDIATRIC AND PREVENTIVE DENTISTRY

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 and understanding:

- 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 analyze scientifically various established facts and data.
- 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.
- 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.
- Adequate clinical experience required for general dental practice
- Adequate knowledge of the constitution, 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 in so far as it affect dentistry**.**

b. Skills:

A graduate should be able to demonstrate the following skills necessary for practice of dentistry.

- 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.
- Prevent and manage complications if encountered while carrying out various surgical and other procedures.
- Carry out certain investigative procedures and ability to interpret laboratory findings.

- Promote oral health and help prevent oral diseases where possible.
- Control pain and anxiety among the patients during dental treatment**.**

c. Attitude:

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

- Willingness to apply the current knowledge of dentistry in the best interest of the patient and 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 CPED Programmes to update knowledge and professional skill from time to time.
- Help and participate in the implementation of the national oral health policy

d. Integration:

A graduate should have good knowledge and should be able to apply the different concepts and manage the patient as a whole.

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 skill
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 instill a positive attitude and behaviour in children towards oral health and understand the principles of prevention and preventive dentistry- right from birth to adolescence.
    - Able to guide and counsel the guardian/parents with regard to various treatment modalities including different facets of preventive dentistry.
    - Able to treat dental diseases occurring in the child patient.
    - Able to manage t physically and mentally challenged/disabled children effectively and efficiently, tailored to the needs of individual requirement and conditions.

4**. TEACHING HOURS**

	Lecture Hours	**Clinical Hours**
Third BDS	20	70
Fourth BDS	45	100
Total	65	170

5. **TEACHING METHODOLOGY**

- Lectures- powerpoint presentations,ohp sheets,interactive sessions
- Seminars
- Evaluation of clinical skills during their practical hours
- CDE programs

- Evaluation of clinical case presentations

6. **THEORY SYLLABUS**

Topic	MUST KNOW	DESIRABLE TO KNOW	NICE TO KNOW
1. Introduction to Pedodontics And Preventive Dentistry.	Definition, Scope, Objectives And Importance		
2. Growth And Development	• Importance of Study of Growth and Development In Pedodontics • Prenatal and Postnatal Factors In Growth and Development • Theories Of Growth And Development • Development Of Maxilla And Mandible and Related Age Changes		
3. Development of Occlusion From Birth Through Adolescence	Study Of Variations And Abnormalities		
4. Dental Anatomy And Histology	• Development of Teeth and Associated Structures • Eruption and Shedding of Teeth • Teething Disorders and their Management • Chronology Of Eruption Of Teeth • Differences Between Deciduous And Permanent Teeth • Importance Of First Permanent Molar		
5. Dental Radiology	Dental Radiology Related To Pedodontics		

Related To Pedodontics			
6. Oral Surgical Procedures In Children	• Indications And Contraindications of Extractions Of Primary And Permanent Teeth In Children • Knowledge Of Local And General Anesthesia • Minor Surgical Procedures In Children		
7. Dental Caries	• Historical Background • Definition, Etiology And Pathogenesis • Caries Pattern In Primary, Young Permanent And Permanent Teeth In Children • Rampant Caries, Early Childhood Caries and Extensive Caries: Definition, Etiology, Pathogenesis, Clinical Features, Complications And Management • Role of Diet and Nutrition In Dental Caries • Dietary Modifications and Diet Counseling • Caries Activity Tests, Caries Prediction, Caries Susceptibility And Their Clinical Application		
8. Gingival And Periodontal Diseases In Children	• Normal Gingiva and Periodontium In Children • Definition, Etiology and Pathogenesis • Prevention And Management of Gingival and Periodontal Diseases		
9. Child Psychology	• Definition		

	• Theories of Child Psychology • Psychological Development of Children With Age • Principles of Psychological Growth and Development While Managing Child Patient • Dental Fear And Its Management • Factors Affecting Child's Reaction To Dental Treatment		
10. Behaviour Management	• Definitions • Types of Behavior Encountered In The Dental Clinic • Non-Pharmacological And Pharmacological Methods Of Behavior Management		
11. Pediatric Operative Dentistry	• Principles of Pediatric operative Dentistry • Modifications Required For Cavity Preparation In Primary And Young Permanent Teeth • Various Isolation Procedures • Restorations Of Decayed Primary, Young Permanent And Permanent Teeth In Children Using Various Restorative Materials Like Glass Ionomer, Composites And Silver Amalgam. • Stainless Steel, Polycarbonate And Resin Crowns		
12. Pediatric Endodontics	• Principles And Diagnosis • Classification Of Pulpal Pathology In Primary, Young Permanent And Permanent Teeth		

	• Management of Pulpally Involved Primary, Young Permanent and Permanent Teeth: Direct And Indirect Pulp Capping, Pulpotomy, Pulpectomy, Apexogenesis And Apexification • Obturation Techniques And Materials Used For Primary, Young Permanent and Permanent Teeth In Children		
13. Traumatic Injuries In Children	• Classification And Importance • Sequelae And Reaction of Teeth To Trauma • Management Of Traumatized Teeth		
14. Preventive and Interceptive Orthodontics	• Definitions • Problems Encountered During Primary and Mixed Dentition Phases and their Management • Serial Extractions • Space Management		
15. Oral Habits In Children	• Definition, Etiology And Classification • Clinical Features Of Digit Sucking, Tongue Thrusting, Mouth Breathing and Various Secondary Habits • Management Of Oral Habits In Children		
16. Dental Care Of Children With Special Needs	Definition, Etiology, Classification, Behavioural and Clinical Features and Management of Children With: Physically Handicapping Conditions, Mentally Handicapping Conditions, Medically Compromising Conditions And Genetic Disorders.		
17. Congenital	Definition, Classification, Clinical Features And		

Abnormalities In Children	Management		
18. Dental Emergencies In Children And Their Management	Dental Emergencies In Children and their Management		
19. Dental Materials Used In Pediatric Dentistry	Dental Materials Used In Pediatric Dentistry		
20. Preventive Dentistry	• Definition • Principles And Scope • Types Of Prevention • Different Preventive Measures Used In Pediatric Dentistry Including Pit and Fissure Sealants and Caries Vaccine		
21. Dental Health Education And School Dental Health Programs	Dental Health Education And School Dental Health Programs		
22. Fluorides	• Historical Background • Systemic And Topical Fluorides • Mechanism Of Action • Toxicity And Management • Defluoridation Techniques		
23. Case History Recording	Outline Of Principles Of Examination, Diagnosis And Treatment Planning		
24. Setting up of Pedodontics Clinic		• Genetics • Growth and development with regard to advanced theory and its applications to	• Pediatric dental implants in children • Applications of lasers in pediatric Dentistry • Regenerative

		patient management • Management of child abuse and neglect • Modifications of spacemaintainers and space management in children • Advanced Oral surgical considerations in young child • Advanced behavior management strategies • Ethics- Introduction, ethics of an individual, profession ethics, research ethics, gathering all scientific factors, gathering all value factors, identifying areas of value conflict, setting of priorities and working our criteria towards decisions.	Endodontics for primary teeth • Orthopaedic appliances for children • Management and Corrective surgical procedures for children with cleft lip and palate

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

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

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

8. THEORY EXAMINATION (3 Hours)

Elaborate on 2 x 10 = 20 Marks
Write notes on 10 x 5 = 50 Marks
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70 Marks
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9. PRACTICAL EXAMINATION- (90 marks)

MANAGEMENT OF CHILD PATIENT IN THE DENTAL CLINIC
Case history - 30 marks
Diagnosis - 20 marks
Treatment plan - 10 marks
Treatment - 30 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.

Theory Internal assessment - 10 Marks
Practical Internal assessment -10 Marks

To assess the clinical knowledge of the student and to understand their ability to manage child patients efficiently.

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. Pediatric Dentistry (Infancy through Adoleseences) - Pinkharn.
2. Clinical Use of Fluorides - Stephen H. Wei.
3. Understanding of Dental Caries - NikiForuk.
4. Handbook of Clinical Pedodonties - Kenneth. D.

5. Dentistry for the Child and Adolescence - McDonald.
6. Pediatric Dentistry -Damle S. G.
7. Behaviour Management - Wright
8. Traumatic Injuries - Andreason.
9. Textbook of Pedodontios – ShobhaTandon

13. REFERENCE BOOKS

1. Paediatric Dentistry (Infancy through Adolescences) – Pinkham.
2. Kennedy's Pediatric Operative Dentistry - Kennedy & Curzon.
3. Occlusalguidaince in Paediatric Dentistry -- Stephen H. Wei.
4. Clinical Use of Fluorides - Stephen H. Wei.
5. Paediatric Oral & Maxillofacial Surgery - Kaban.
6. Paediatric Medical Emergencies - P. S. Whatt.
7. Understanding of Dental Caries – Niki Forutk.
8. An Atlas of Glass lonomer cements - G. J. Mount.
9. Clinical Pedodontics - Finn.
10. Textbook of Pediatric Dentistry - Braham Morris.
11. Primary Preventive Dentistry - Norman 0. Harris
12. Handbook of Clinical Pedodontics – Kenneth.D
13. Preventive Dentistry - Forrester.
14. The Metabolism and Toxicity of Fluoride Garry M. Whitford.
15. Dentistry for the Child and Adolescent – Mc. Donald.
16. Pediatric Dentistry – Damle S.G.
17. Behaviour Mangement – Wright.
18. Pediatric Dentistry - Mathewson.
19. Traumatic Injuries – Andreason
20. Occlusal guidance in Pediatric Dentistry - Nakata.
21. Pediatric Drug Therapy - Tomare
22. Contemporary Ortodontics - Profitt.
23. Preventive Dentistry - Depaola.
24. Metabolism & Toxicity. of Fluoride - Whitford. G. M.
25. Endodontic Practice - Grossman.

26. Principles of Endodontics - Munford.
27. Endodontics - Ingle.
28. Pathways of Pulp - Cohen.
29. Management of Traumatized anterior Teeth - Hargreaves.

14. CRI POSTING SCHEDULE AND ORIENTATION

During their posting in Pedodontics the Dental graduates shall perform:

1. Topical application of fluorides including varnish	5Cases
2. Restorative procedures of carious deciduous teeth in Children.	10Cases
3. Pulpotomy	2Cases
4. PuIpectomy	2Cases
5. Fabrication and insertion of space mainteners	1Case
6. Oral habits breaking appliances	1Case

Period of Postings

Pedodontics - 1 Month

14. ORTHODONTICS AND DENTOFACIAL ORTHOPAEDICS

1. **GOAL**

Practice respective speciality efficiently and effectively, backed by scientific knowledge and skill;

- exercise empathy and a caring attitude and maintain high ethical standards;
- continue to evince keen interest in professional education in the speciality and allied specialities whether in teaching or practice;
- willing to share the knowledge and skills with any learner, junior or a colleague;
- to develop the faculty for critical analysis and evaluation of various concepts and views and to adopt the most rational approach

2. **OBJECTIVES**

The objective of the Under graduate training is to train a student so as to ensure higher competence in both general and special area of interest and prepare him or her for a career in teaching, research and speciality practice. A student must achieve a high degree of clinical proficiency in the subject and develop competence in research and its methodology in the concerned field. The objectives to be achieved by the candidate on completion of the course may be classified as under :

- Knowledge and Understanding
- Skills
- Attitude
- Knowledge about infections and cross infections in Dental Practice – HIV and Hepatits control
- Computer Proficiency

a. <u>KNOWLEDGE:</u>

(i) Demonstrate understanding of basic sciences relevant to speciality;
(ii) Describe aetiology, pathophysiology, principles of diagnosis and management of common problems within the speciality in adults and children;
(iii) Identify social, economic, environmental and emotional determinants in a given case and take them into account for planned treatment;
(iv) Recognise conditions that may be outside the area of speciality or competence and to refer them to the concerned

specialist;
(v) Knowledge by self study and by attending courses, conferences and seminars pertaining to speciality;
(vi) Undertake audit, use information technology and carry out research in both basic and clinical with the aim of publishing or presenting the work at various scientific gathering.

b. SKILLS:

I. take a proper clinical history, examine the patient, perform essential diagnostic procedures and order relevant tests and interpret them to come to a reasonable diagnosis about the condition;
II. acquire adequate skills and competence in performing various procedures as required in the speciality.

c. ATTITUDE:

HUMAN VALUES, ETHICAL PRACTICE AND COMMUNICATION ABILITIES.

I. adopt ethical principles in all aspects of practice;
II. foster professional honesty and integrity;
III. deliver patient care irrespective of social status, caste, creed, or religion of the patient;
IV. develop communication skills, to explain various options available and obtain a true informed consent from the patient;
V. provide leadership and get the best out of his team in a congenial working atmosphere;
VI. apply high moral and ethical standards while carrying out human or animal research;
VII. be humble and accept the limitations in his knowledge and skill and to ask for help from colleagues when needed;
VIII. respect patient's rights and privileges including patient's right to information and right to seek a second opinion

d. INTEGRATION:

Students should have a holistic understanding of each of the pathological situation and be able to frame a comprehensive treatment plan and deliver treatment to the limitations of what she/ he is trained and efficient and at the same time refer to the concerned specialists thereafter for opinion / further management .

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**

	Lecture Hours	Clinical Hours
3rd Year	20	70
4th Year	30	100

5**. TEACHING METHODOLOGY**

Use of active methods of learning should be encouraged, which would enable students to develop personality, communication skills and other qualities which are necessary, such as:

1. Group discussions,
2. Seminars,
3. Role play,
4. Field visits,
5. Demonstrations,
6. Peer interactions etc.,

Make maximum efforts to encourage integrated teaching and de-emphasize compartmentalisation of disciplines so as to achieve horizontal and vertical integration in different phases

6. **THEORY SYLLABUS**

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

TOPIC	MUST KNOW	DESIRABLE TO KNOW	NICE TO KNOW
Growth and Development: In general	1. Definition 2. Growth spurts and differential growth 3. Factors influencing growth and development 4. Methods of measuring growth		

	5. Growth theories (Genetic, Sicher's, Scott's, Moss's, Petrovics, Multifactorial) 6. Genetic and Epigenetic factors in growth 7. Cephalocaudal gradient in growth		
Morphologic development of craniofacial structures	Methods of bone growth Prenatal growth of craniofacial structures Postnatal growth and development of: Cranialbase, Maxilla, Mandible, Dental arches and occlusion.		
Functional development of dental arches and occlusion	Factors influencing functional development of dental arches and occlusion Forces of occlusion Wolfe's law of transformation of bone Trajectories of forces		
Clinical application of growth and development Malocclusion – In general	Concept of normal occlusion Definition of Malocclusion Description of different types of dental, skeletal and functional malocclusion		
Classification of Malocclusion: Principle, description, advantages and disadvantages of classification of malocclusion by Angle's, Simon's, Lischer's and Ackerman and Proffitt's. Normal and abnormal function of	Definition, importance, classification, local and general etiological factors. Etiology of following different types of malocclusion		

Stomatognathic system Aetiology of malocclusion			
Midline diastema Spacing Crowding Cross bite: anterior/posterior Class III malocclusion Class II malocclusion Deep bite Open bite Diagnosis and diagnostic aids	Definition, importance and classification of diagnostic aids Importance of case history and clinical examination in orthodontics Study models: - importance and uses – preparation and prevention of study models Importance of intraoral X-rays in orthodontics Cephalometrics: Its advantage and disadvantage		
Definition Description and use of cephalostat Description and use of anatomic landmarks lines and angles used in cephaometric analysis Analysis – Steiner's, Down's, Tweed's, Ricket's-E-line	Panoramic radiograph- Principles, advantage, disadvantage and uses Electromyography and its uses in orthodontics Wrist X-rays and its importance in orthodontics		
General principles in orthodontic treatment planning of dental and skeletal malocclusion Anchorage in	Different types of tooth movement Tissue response to orthodontic force application Age factor in orthodontic tooth movement		

orthodontics – definition, classification, types and stability of anchorage Biomechanical principles in orthodontic tooth movement			
Preventive orthodontics	Definition Different procedures undertaken in preventive orthodontics and their limitation		
Interceptive orthodontics	Definition Different procedures undertaken in interceptive orthodontics and their limitations Serial extractions: Definition, indication, contra indication, technique, advantages and disadvantages Role of muscle exercises as an interceptive procedures		
Corrective orthodontics	Definition, factors to be considered during treatment planning Model analysis: Pont's, Ashley Howe's, Bolton, Carey's, Moyer's mixed dentition Analysis. Methods of gaining space in the arch: Indications, relative merits and demerits of proximal stripping, arch expansion and extractions, molar distalisation. Extractions in orthodontics- indications and selection of teeth for extraction.		
Orthodontic appliances: General	Requisites for orthodontic appliances Classification, indications of removable and functional appliances Methods of force applications Material used in construction of various orthodontic appliances – uses of		

	stainless steel, technical consideration in curing of acrylic, principles of welding and soldering, fluxes and antifluxes Preliminary knowledge of acid etching and direct bonding		
Ethics in practice of dentistry and patient care Removable Orthodontic Appliances	Components of removable appliances Different types of clasps and their uses Different types of labial bows and their uses Different types of springs and their uses Expansion appliances in orthodontics *Principles *Indications of arch expansion *Descriptions of expansion appliances and different types of expansion devices and their uses *Rapid maxillary expansion		
Fixed Orthodontic Appliances	Definition, Indications and Contraindications Component parts and their uses Basic principles of different techniques: Edgewise, Begg's, straight wire		
Extra Oral Appliances	Headgears Chin cups Reverse pull headgear		
Myo Functional Appliances	Definition and principles Muscle exercises and their uses in orthodontics Functional appliances * Activator, Oral screens, Frankel's functional regulator, Bionator, Twin block, Lip bumper * Inclined planes – upper and lower		
Orthodontic management of Cleft lip and palate Principles of surgical orthodontics	Brief knowledge of correction of : Mandibular Prognathism and Retrognathism Maxillary prognathism and retrognathism Anterior open bite and deep bite Cross bite		
Principles, differential diagnosis	Midline diastema Cross bite Deep bite Open bite Spacing Crowding Class II - Division 1,Division 2		

and the methods of treatment of :	Class III Malocclusion–True and Pseudo class III		
Retention and Relapse	Definition Need for retention Cause of relapse Methods of retention Different types of retention devices Duration of retention Theories of retention		
Clinicals and Practicals in Orthodontics		Model Analysis Pont's Ashley Howe's Carey's Boltons Moyers	
Cephalometric Analysis		Down's Steiners Tweeds	Implants In Orthodontics Cbct – Applications Hand Wrist Xray Tracing Digital Records Orthodontic Clinical Set Up Sterilisation In Orthodontics Soft Wares Applications In Orthodontics Accelerated Orthodontics Adult Orthodontics

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 TRAINING

1. Discussion of 5 Clinical Cases – Each Of Different Types:
   Dentoalveolar Malocclusion : Class I/II/III Malocclusion With :Proclination/Spacingdeep Bite/Open Bite, Etc
   Skeletal Class II: Growing Individuals Requiring Growth Modification
   Skeletal Class II: Non Growing Requiring Surgical Correction
   Skeletal Class III: Growing Individuals Requiring Growth Modification
   Skeletal Class III: Non Growing Requiring Surgical Correction

2. Fabrication And Delivery Of 5 Removable Appliances
3. Mixed Dentition Analysis
4. Permanent Dentition Space Analysis
5. Demostration Of Welding And Soldering
6. Demostration Of Cephalometric Tracing
7. Demostration Of Fixed appliance

PROCEDURES: practical exercises required to be proficient about as given below
DEMONSTRATION: Teaching faculty should demonstrate each of the exercises and guide students to understand the properties of the components, their use and method of activating and adjusting them when incorporated in the orthodontics appliances.

PRACTICAL EXERCISES REQUIRED TO BE PROFICIENT ABOUT :

- Basic wire bending exercise Gauge 22 or 0.7mm

1. Straightening of wire (4 Nos)
2. Bending of a equilateral triangle
3. Bending of a rectangle
4. Bending of a square
5. Bending of a circle
6. Bending of U.V.

Labial bows:

1. Short labial bow
2. Long labial bow

3. Robert's retractor
4. Split labial bow
5. High labial bow with apron spring

CLASPS:

- Construction of clasps (Both sides upper / lower) Gauge 22 or 0.7mm
- ¾ clasp (C-Clasp)
- Full clasp (Jackson's Crib)
- Adam's clasp
- Triangular clasp

Construction of springs (on upper both sides) Gauge 24 or 0.5mm

A) Finger spring

B) Single cantilever spring

C) Double cantilever spring (Z- spring)

- Construction of canine retractors

A. Buccal canine retractor
B. Helical canine retractor
C. U loop cnine retractor
D. Palatal canine retractor

Appliances:

A. Upper hawley's appliance
B. Upper hawley's appliance with anterior bite plane
C. Upper hawley's appliance
D. With tongue spikes
E. Upper hawley's retainer appliance

8. **THEORY EXAMINATIONS**

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

	Marks	Total
1. Clinicals/OSCE/OSPE/Spotters: 10 Stations	10 X 3 Marks	30 Marks
2. Clinical Case Discussion Intra & Extra Oral		
Findings :	10 Marks	
Diagnosis:	10 Marks	
Treatment Plan:	10 Marks	30 Marks
3. Working Skill Wire Bending Skill		
Adam's Clasp:	10 Marks	
Labial Bow :	10 Marks	
Spring :	10 Marks	30 Marks
		90 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.

IA will be based on :

1) wire bending exercise/ assignment completion

2) Attendance in Lab classes and clinical
3) clinical assignment completion on time
4) patient care – ethics , communication, behaviour , responsibility

11. RECORD NOTE / LOG BOOK

Record shall be maintained as per University norms 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. Essentials Of Orthodontics By Neil T Reske
2. Removable Orthodontic Appliances By Philip Adams
3. Text Bookm Of Orthodontics By Samir E Bishara
4. Wire Bending By Dickson
5. Dental Materials By Anu Savice
6. Understanding Orthodontics By Perry
7. Orthodontic Notes By Walter & Houston
8. Handbook Of Facial Growth By Enlow & Hans
9. A Text Book Of Orthodontics By Wjb Houston , Stephans ,Tilley
10. Removable Orthodontic Appliance By Isaacson
11. Principles And Practice Of Orthodontics By J R E Mills

13. **Reference Books**

1. Contemporary Orthodontics - William Proffit
2. Orthodontics For Dental Students - White And Gardiner
3. Handbook Of Orthodontics - Moyers
4. Orthodontics – Principles And Practice - Graber
5. Design, Construction And Use Of Removable Orthodontic Appliances - C. Philip Adams
6. Clinical Orthodontics : Vol 1 & 2 - Salzmann

14. CRI POSTING SCHEDULE AND ORIENTATION

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

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

The dental graduates shall do the following laboratory work:-

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

Period of Postings
Orthodontics - 1 Month

15. PERIODONTOLOGY

1. **GOAL**

To impart optimal knowledge to the students within the preview of the curriculum designed by the DCI- under the following guidelines-must know – desirable to know –nice to know.

2. **OBJECTIVES**

a. Knowledge and understanding:

To have adequate knowledge and understanding of the basic periodontal tissues, etiology, pathophysiology, diagnosis and treatment planning for various periodontal disease/ problem.

b. Skill:

To chart a proper clinical history after thorough examination of the patient, able to perform diagnostic procedure; able to interpret laboratory investigation; arrive at a provisional / definitive diagnosis regarding the periodontal problem in question.

c. Attitude:

To develop the right attitude to store his knowledge and the willingness to learn newer concept so as to keep pace with current technology and development; also to seek opinion from an allied Medical Dental specialist as and when required.

d. Integration:

From the integrated teaching of other clinical sciences, the students shall be able to describe the various signs, and symptoms and interpret the clinical manifestations of disease processes.

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. Virus 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 CLASSES:

III BDS- 30 Hours
Final BDS- 50 Hours
Total: 80 hours

CLINICAL HOURS:

III BDS- 70 Hours
Final BDS- 100 Hours
Total - 170hours

5. **TEACHING METHODOLOGY**

THIRD BDS (DURING CLINICAL POSTING)

i. Infection control
ii. Periodontal instruments and instrumentation
iii. Chair position, ergonomics, principles of instrumentation; maintenance of instruments
iv. Basic tissues- gingiva , periodontal ligament, cementum, alveolar bone.
v. Plaque control- both mechanical and chemical
vi. Motivation of patients- oral hygiene instructions & education with typhodont

FINAL BDS(DURING CLINICAL POSTING)

i. Revision of third BDS tutorial
ii. Diagnosis / classification of periodontal disease
iii. Determination of prognosis and treatment plan
iv. Radiographic interpretation and lab diagnosis
v. Ultrasonic instrumentation
vi. Principles of periodontal surgery
vii. Periodontal surgical procedure and suturing technique
viii. Concepts of local drug delivery
ix. Occlusion – correction & management.
x. Splinting techniques

xi. Treatment of dental hypersensitivity
xii. Implants- basics.

6. THEORY SYLLABUS

TOPIC	MUST KNOW	DESIRABLE TO KNOW	NICE TO KNOW
Third BDS lecture classes : 40 hours	1.Instruments and instructions 2. Gingiva 3. Junctional epithelium, gingival pigmentation 4. GCF & saliva 5. Cementum 6. Periodontal ligament 7. Ageing and the periodontal & alveolar bone 8. Classification of periodontal disease 9. Epidemiology of gingival and periodontal disease 10. Plaque – introduction, properties, structure and formation 11. Plaque – Microbial specificity, micro organisms associated with periodontal disease 12. Calculus 13. Immunology – basic concepts 14. Immunology – microbial host interaction 15.Gingivitis 16. Acute lesions of gingiva 17.Gingival enlargements 18. Gingival bleeding 19. Gingival recession 20. Gingival disease in childhood 21. Mechanical plaque control	Genetic factors associated with periodontal disease.	1. Desqumative gingivitis 2. Influence of endocrine disorders& hormonal changes on the periodontium 3. Influence of haematological disorders& immune deficiencies on the periodontium 4. Stress & psychosomatic disorders and the periodontium 5. Nutritional influences on the periodontium 6. Smoking and periodontal disease.

	22. Chemical plaque control 23. Systemic administration of drugs in periodontal therapy 24. Chronic &aggressive periodontitis 25. Periodontal pocket 26. Abscesses of the periodontium – gingival, periodontal &pericoronal 27. HIV & the periodontium 28. Bone loss and patterns of bone destruction 29. Trauma from occlusion 30. Furcation involvement 31. Tooth mobility 32.Halitosis& Hypersensitivity		
Final B.D.S.	1.Periodontal medicine 2.Clinical diagnosis 3.Radiograhic and diagnostic aids in the diagnosis of periodontal disease 4. Risk factors & risk assessment 5. Determination of prognosis 6. Treatment plan 7. Periodontal treatment of medically compromised patient 8. Iatrogenic factors in the etiology of periodontitis 9. Orthoperio inter –relationship 10.Endo- perio inter – relationship 11.Prostho- perio inter – relationship 12.Host modulation & therapy 13.non-surgical therapy 14. Local drug delivery 15. Splinting 16. Surgical anatomy & general principles of	1. Advanced regenerative procedure in periodontics 2. Recent advances in periodontal surgery 3. Periodontal plastic and esthetic surgery 4. Application of micro surgery in periodontics. 5. Implants – surgical concepts. 6. Supportive implant treatment	1. Advanced diagnostic technique-microbiological,immunological & radiographic 2. Mucogingival surgery. 3. Lasers in periodontics.

	periodontal surgery 17.Gingival surgical techniques –periodontal dressing 18.Periodontal flap surgery 19.Gingivectomy and gingivoplasty 20.Resective osseous surgery 21.Regeneration in periodontal therapy 22. Healing in periodontal therapy 23.Failures in periodontal therapy 24.Supportive periodontal therapy 25.Periodontal plastic and esthetic surgery 26.Multi- disciplinary approach for the management of periodontal disease 27.Diagnosis and treatment of periodontal emergencies 28. Implant basics and diagnosis , treatment planning 29. Peri-implant disease and management.		

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 / CLINICALS

Case history taking followed by discussion

Final BDS :	5 long cases
	10 short cases
Oral prophylaxis - Handscaling -	75 cases

Demonstration of surgical procedure

Maintenance therapy

8. THEORY EXAMINATION (3 Hours0

Elaborate on 2x10 marks = 20 marks
Write notes on 10 x5 marks = 50 marks

Total = 70 marks
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9. PRACTICALS/ CLINICALS EXAMINATIONS

Clinical procedures
1. Case sheet writing for the given case
2. Scaling
3. Spotters-Instruments, Radiographic interpretation chair side clinical diagnosis

Scheme for Clinical /Practical Examination
Practical - 90 marks
Case Sheet Writing - 10 marks
Scaling - 50 marks
Spotters - 20 marks
Chairside viva - 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.

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

Carranza ‘s Clinical Periodontology

13. REFERENCE BOOKS

i. ClinicalPeriodontology & implantology by Jan Lindhe
ii. Contemporary Peridontics by Robert Genco Henry Goldman
iii.Essentials of Periodontology and periodontics – Torquil MacPhee
iv. Contemporary Periodontics – Cohen
v. Periodontal therapy – Goldman
vi. Orbans’ periodontics – Orban
vii. Oral Health Survey – W.H.O.
viii.Preventive Periodontics – Yound and Stiffler
ix. Public Health Dentistry – Slack
x. Advanced Periodontal Disease – John Prichard
xi. Preventive Dentistry – Forrest
xii. Periodontics – Baer & Morris.

14. CRI POSTING SCHEDULE AND ORIENTATION

A. The dental graduates shall perform the following procedures

1. Prophylaxis	15cases
2. FlapOperation	2cases
3. RootPlanning	1case
4. Currettage	1case
5. Gingivectomy	1case
6. Perio-Endo cases	1case

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

Period of Postings

Periodontics - 1 Month

16. PROSTHODONTICS AND CROWN AND 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:

1) 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 analyze scientifically various established facts and deals.
2) 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.
3) 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.
4) Adequate clinical experience required for the general dental practice.
5) Adequate knowledge of the constitution, biological functions and behavior 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 affects dentistry.

b. ATTITUDE:

During the training period, a graduate should develop 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 CPED programmes to update knowledge and professional skill time to time.
5. 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 for practice in dentistry.

1. 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.
2. Prevent and manage complications if encountered while carrying out various surgical and other procedures.
3. Carry out certain investigative procedures and ability to interpret laboratory findings.
4. Promote oral health and help prevent oral disease where possible.
5. 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

III BDS

Subject	**Lecture Hours**	**Practical Hours**	**Clinical Hours**
Prosthodontics & Crown & Bridge	30		70

IV BDS

Subject	**Lecture Hours**	**Practical Hours**	**Clinical Hours**
Prosthodontics & Crown & Bridge	80		300
Total Hours	**110**		**370**

5. TEACHING METHODOLOGY

The objectives of teaching methodology 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 SYLLABUS INCLUDING BIO-ETHICS, DENTAL JURISPRUDENCE.**

TOPIC	MUST KNOW	DESIRABLE TO KNOW	NICE TO KNOW
Under graduate student must have the following knowledge	• Diagnosis and Treatment Planning in Complete Denture. • History and Patient Evaluation in Complete Denture. • Anatomical Landmarks in Maxilla and Mandible. • Principles and Objectives of Impression Making. • Special Tray Fabrication and Secondary Impression. • Record Base Fabrication and Occlusal Rims. • Recording Centric Jaw Relation. • Articulators. • Arrangement of Artificial Teeth. • Fabrication of Complete Denture –Lab Procedure • Relining and Rebasing Procedures.	• Mouth Preparation in Complete Denture Fabrication. • Single Complete Denture. • Over Dentures. • Recording Neutral Zone. • Surveying in RPD • Cast Partial Dentures. • Attachments in RPD. • Principles in RPD. • Immediate Dentures. • Materials in FPD. • Fluid Control and Soft Tissue Management.	• Balancing in Complete Dentures • Semi Adjustable and Fully Adjustable Articulators. • Interocclusal Records in Complete Denture. • Implant Supported Complete Denture. • RPI concept in RPD. • Occlusion in FPD. • Implant Abutments. • Laminate and Veneers. • Obturators. • Implant retained Prosthesis. • Cleft Lip and Cleft Palate Management. • Implant Prosthesis • Grating Techniques in

	• Classification of Partially Edentulous Arch. • Major Connectors and Minor Connectors. • Retainers in RPD. • Construction of Removable Denture. • Indication and Contraindication of FPD. • Parts of Fixed Partial Denture. • Principles of Tooth Preparation. • Types of FPD. • Impression Making in FPD. • Soldering and Welding Techniques. • Luting Cements. • Types of Maxillofacial Defects. • Materials Used in Maxillofacial Prosthesis. • Diagnosis and Treatment Planing for Implant • Oseointegration. • Titanium. • Classification of Implants. • Temporomandibular joint Anatomy. Temporomandiibular joint Disorders.	• Resin Bonded Bridges. • Lab Proceduresin FPD Fabrication. • Extraoral defects ,Intra oral defects and its Managements. • Stents in Implant Placement. • Instruments and Parts of Implant. • Surgical Procedures in Implant Placement.	Implant.Surgery. Loading Protocol in Implants.
Bio-Ethics	1. Respect human life and the dignity of every individual. 2. Refrain from supporting or committing crimes against humanity and codemn all such acts. 3. Treat the sick and injured with		

	competence and compassion and without prejudice and apply the knowledge and skills when needed. 4. Protect the privacy and confidentiality of those for whom we care and breach that confidence only when keeping it would seriously threaten their health and safety or that of others. 5. Work freely with colleagues to discover, develop, and promote advances in medicine and public health that ameliorate suffering and contribute to human well being. 6. Educate the public about present and future threats to the health of humanity. 7. Advocate for social, economic, educational and political changes that ameliorate suffering and contribute to human well being. 8. Teach and mentor those who follow us, for they are the future of our caring profession.		

7. PRACTICALS

Procedures

It includes fabrication of the following

Complete Dentures - 5

Removable Partial Dentures -30

Demonstrations
It includes Demonstration of steps in Complete Denture Fabrication . Demonstration of tooth preparation in artificial teeth.

8. THEORY EXAMINATION (3 Hours)

Elaborate on : 2 x 10 marks = 20 Marks
Write notes on: 10 x 5 marks = 50 Marks
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70 Marks
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9. PRACTICAL / CLINICAL EXAMINATIONS – OSCE/OSPE

PRACTICALS: 90 marks

FINAL YEAR:
COMPLETE DENTURE:

1. Case history and Discussion with Instrumentation: 10 Marks -15 Minutes
2. Border molding with special tray: 15 Marks - 30 Minutes
3. Master impression (patient may be completely edentulous or single edentulous arch) 20Marks -15 Minutes

FIXED PROSTHODONTICS:

1. Articulated Model and Instrumentation: 10 Marks -10 Minutes
2. Tooth preparation in Articulated artificial teeth: 25 Marks -45 Minutes

SPOTTERS 10 Marks-20 Minutes
Cast partial denture
Identification of Kennedys Class in RPD
Elastomeric materials
Semi Adjustable Articulators
Mean Value and Hinge Articulators
Face Bow

Surgical Obturator
Feeding Plate
Abrasives and Polishing agents
Acrylic ,Metal Ceramic ,Full metal Crowns and Bridges

Total: 90 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.

Theory Internal Assessment - 10 marks
Practical /Clinical Internal Assessment-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

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.

14. CRI POSTING SCHEDULE AND ORIENTATION

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

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

Period of Postings

Prosthodontics - 1 ½ Months

17. CONSERVATIVE DENTISTRY AND ENDODONTICS

1. **GOAL**

- To acquire adequate knowledge, necessary skills and 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.
- To provide critical knowledge and understanding of conservative dentistry and endodontics.
- To train the undergraduate students and equip with knowledge, attitude and skills necessary to carry out procedures in conservative dentistry and endodontics.

2. **OBJECTIVES**

a. KNOWLEDGE AND UNDERSTANDING:

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

- Adequate knowledge and understanding of Etiology, Diagnosis and Treatment procedures.
- 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 analyze scientifically various established facts and data.
- 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.
- 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.
- Adequate clinical experience required for general dental practice.
- Adequate knowledge of biological function and behavior 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:

A graduate should be able to demonstrate the following skills necessary for practice of dentistry.

- 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.
- Acquire skill to prevent and manage complications if encountered while carrying out various dental surgical and other procedures.
- Possess skill to carry out required investigative procedures and ability to interpret laboratory findings.
- Promote oral health and help to prevent oral diseases wherever possible.
- Competent in control of pain and anxiety during dental treatment.

c. ATTITUDE:

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

- Have empathy for the patient and do the best possible as situation demands
- 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:

- At the conclusion of the course the student should be able to diagnose and treat the disease efficiently.
- Should integrate interdisciplinary approach and management

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

- Competent to diagnose all carious lesions
- Competent to perform class 1 and class 2 cavities and restoration with amalgam
- Competent to perform class 3 and class 4 cavities and restoration with glass ionomer cement
- Competent to perform anterior root canal treatment.
- Take proper chair side history, examine the patient and perform medical and dental diagnostic procedures and order as well as perform relevant tests and interpret 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.

4. **TEACHING HOURS**

MAXIMUM WORKING HOURS FOR BDS

SUBJECT	LECTURE HOURS	CLINICAL HOURS
CONSERVATIVE DENTISTRYAND ENDODONTICS	110	370

MINIMUM WORKING HOURS FOR BDS

YEAR	SUBECT	LECTURE HOURS	CLINICAL HOURS
3rd BDS	CONSERVATIVE DENTISTRY AND ENDODONTICS	30	70
4TH BDS	CONSERVATIVE DENTISTRY AND ENDODONTICS	80	300
TOTAL HOURS		110	370

Lecture hours-conservative topics class 1 ,2 amalgam, inlay ,class V can be taught in 3rd BDS.

Practical hours/clinical hours -4th year student to observe other procedures like

- Rotary endodontics
- RVG
- Thermoplasticized gutta percha
- Rubber dam application

- Bleaching of vital/non vital teeth
- Cast post
- Diastema closure
- Rubber base impression

5. **TEACHING METHODOLOGY**

- To be more interactive
- Student should come with sufficient information to be able to receive the applied concepts and skills better.
- Student should be keen to learn and demonstrate

The objectives of teaching Conservative dentistry 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 INCLUDING BIO-ETHICS AND JURISPRUDENCE**

Topic	Must Know	Desirable To Know	Nice To Know
1.	• Class 1 Amalgam • Class 1amalgam With Buccal and Palatal Extensions • Class 2 Amalgam • Class 3 And Class 5 Gic Management Of Deep Caries-Temporary Restorations	• Anterior Root Canal Treatment • Class 4 Composite • Observations/Demonstrations of Vitality Assessment-Ept W L Assessment –Apex Locators Periapical Surgery Midline Diastema Bleaching Cast /Fibre Post Avulsed	• Indirect Restorations-Casting Procedures • Observations/ Demonstrations of Magnification-Loupes Rvg Rotary Endodontics Thermoplastisized Gutta Percha Ceramic

		Tooth Management - Holding Medium -Splinting • Rubber Dam Application	Processing Management of Trauma Rubber Base Impression Procedures
2.Additional Topics		• Biofilms • Magnification-Microscopes, Microscopic Surgery,Loupes • Recent Classification Of Trauma • Newer Concepts In Caries • Rotary Endodontic Techniques • Veneers • Light Cure Lamps, Bleaching Lights • Core Build Up Materials	
3.	1. Anterior Rct 2.Class Iv Composite 3. Midline Diastema and Space Management 4.Bls Course(Basic Life Support)-3 Days	1. Premolar Rct 2. Full Crown	1. Magnification Loupes 2. Management of Avulsed/Subluxated Tooth
Lecture Classes:	1. Introduction To Operative Dentistry 2. Glossary & Its Significance. 3. Tooth Designation & System Followed. 4. Classification of Caries 5. Basic Principles In Cavity Preparation 6. Instruments & Equipment for Tooth Preparation. 7. Cavity Preparation for Amalgam. 8. Cavity Preparation for Inlay		

	9. Tooth Preparation for Tooth Colored Materials 10. Matrices and Retainers 11. Deep Caries Management 12. Introduction to Root Canal Treatment and Pulpotomy. 13. Operators Position, and Chair Position for the Patient. 14. Basic aspects of Sterilization of Instruments and Equipment 15. Basic aspects of Management of Various Restorative Materials. (Amalgam, Cement, Glass Ionomer, Composites)		
Conservative Dentistry	• Definition & Scope, Oral Hygiene in Relation to Conservative Dentistry. Instruments - Nomenclature, Design and Formulae, Care and Sterilization, Examination, Diagnosis and Treatment Planning, Charting and Recording of Cases, Cavities Classification and Nomenclature, Choice of Filling Materials. • Principles of Cavity Preparation, • Control of Pain, Prevention of Damages to Hard		

	and Soft Tissues During Operative Procedures. • Methods Employed for Exclusion of Saliva. • Bio Mechanics of Cavity Design and Restoration with Filling Materials, Pulp and Soft Tissue Protection. • Airotors and High Speed Equipment. • Cavity Preparation for Various Types of Restorations Including Inlays and Onlays. Restorative Procedures, Matrices, Drugs Used In The Conservative Dentistry Fractured Teeth and Their Treatment Hypersensitivity and its Treatment, Ceramics In Conservative Dentistry.		
Endodontics	• Rationale of Endodontic Therapy, Diagnostic Aids In Endodontics Care and Sterilization of Instrument for Endodonic Treatment of Vital and Non-Vital Pulp, Tests for Sterility of the Root Canal. Drugs Used In Root Canal Therapy. • Bleaching of Teeth. • Restoration of Endodontically Treated Teeth,Surgical Endodontics.		

Biomedical Ethics	• Respect Human Life and the Dignity of Human Individual • Refrain From Supporting or Commiting 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		

7. PRACTICALS

EXERCISES FOR PRECLINICAL TRAINING - II YEAR B.D.S.

Exercise I
- Excavation of Deep Caries&
- Indirect Pulp capping

Exercise II :
- Excavation of Deep Caries
- &Direct Pulp capping

Exercise III
- Pulpotomy

Exercise IV
- Class preparations to

receive

- Silver Amalgam
- One Lower Molar with Buccal Extension – 1
- One Lower Premolar - 1. One Upper Molar -1.

Exercise V

- Class II preparation for Silver Amalgam.
- One Lower Molar (Mesio Occlusal) - 1
  One Lower Premolar (Disto Occlusal) - 1

- One Upper Molar (Disto Occlusal) -1

Exercise VI: Class III preparation for tooth ColouredMaterial
One Upper Central Incisor (Palatal Approach) -1
One Lower Central Incisor (Labial Approach) -1

Exercise VII: Class V Preparations One Upper Canine -(Tooth coloured Material) -1
One Lower Molar (Amalgam)

Exercise VIII: Inlay Preparation
One Lower Molar (Mesio Occluso Distal) -1. One Upper Molar (Occlusal) -1

Exercise IX: Access cavity preparation One Upper Lateral Incisor-1

Exercise X: observation on Fractured teeth

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

ELABORATE ON 2 x 10	=	20 MARKS
WRITE NOTES ON 10 X 5	=	50 MARKS
		70 MARKS

Note: Elaborate On : One Essay in Conservative Dentistry and One Essay in endodontics
Write Notes on: Four questions in conservative Dentistry, Four questions in Endodontics, One question in Dental Materials and One question in Esthetic Dentistry.

9. **PRACTICAL/CLINICAL EXAMINATIONS**

Clinical Exercises

I. Preparation for class II amalgam and restoration
Or
Preparation for Class I amalgam with buccal / palatal extension
Or
II. Anterior composite restoration
Or
III. Root canal treatment for anterior tooth up to WL determination

Mark distribution for the clinical examinations

I. CLASS I / CLASS II amalgam restoration

Case history recording, examination, diagnosis and treatment planning	: 10 marks
Tooth preparation	: 35 marks
Base and matrix	: 15 marks
Restoration and carving	: 30 marks
Total	90 marks

Or

II. Anterior composite restoration

Case history recording, examination, diagnosis and treatment planning	: 10 marks
Tooth preparation	: 35 marks
Lining and matrix	: 15 marks
Restoration	: 20 marks
Finishing	: 10 marks
Total	: 90 marks

Or

III. Anterior RCT

• Case history recording, examination, diagnosis and treatment planning	: 10 marks
• Access preparation	: 35 marks
• Working length	: 15 marks
• Cleaning and shaping	
• Master cone selection	: 30 marks
Total	90 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 3months.

IA Marks
Theory IA Marks : 10
Practical IA Marks: 10

11. RECORD 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

DENTAL MATERIALS

1. Restorative Dental Materials -Robert G.Craig
2. Notes on Dental Materials - E.C.Combe

CONSERVATIVE DENTISTRY AND ENDODONTICS

1. The Art & Science of Operative Dentistry, Sturdevant, MosbyU.S.A
2. Pickard's manual of operative dentistry
3. Principle & Practice of Operative Dentistry, Charbeneu,Varghese Publishing, Mumbai.
4. Grossman's Endodontic Practice, B. Suresh Chandra & V. GopiKrishna, WoltersKluwer

13. REFERENCE BOOKS

1) Introduction to Dental Materials, Van Noort,
2) Applied Dental Materials, McCabe,

3) Ingle’s textbook of endodontics
4) Cohen’s Pathways of Pulp
5) Fundamentals of Operative Dentistry: A Contemporary Approach-James b.Summit

14. CRI POSTING SCHEDULE AND ORIENTATION

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

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

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Period of Postings
Conservative Dentistry - 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

xiv. Extraction of teeth; Howe.Gl
xv. Minor Oral Surgery; Howe.Gl
xvi. Contemporary oral and maxillofacial surgery; Peterson I.J. et al
xvii. Oral and maxillofacial infections; Topazian RC & Goldberg MH

14. CRI POSTING SCHEDULE AND ORIENTATION

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

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

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

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

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

Period of Postings

Oral & Maxillofacial Surgery - 1 ½ Months

19. PUBLIC HEALTH DENTISTRY

1. **GOAL**

To provide critical knowledge and understanding of public health dentistry To develop students understanding of the major oral health problems of community To equip students with the ability to critically analyze dental public health problems and develop practical solutions to protect and promote the oral health for the community To enable students to understand and undertake health services research and to apply key findings into dental public health practice

2. **OBJECTIVES**

a. KNOWLEDGE:

Apply basic sciences knowledge regarding etiology, diagnosis and management of all the oral conditions at the individual and community level Identify social, economic, environmental and emotional determinants in a given individual patient or a community for the purpose of planning and execution of community oral health programme. Ability to conduct oral health surveys in order to identify all the oral health problems affecting the community and find solutions using multi-disciplinary approach. Ability to act as a consultant in Community Oral Health and take part in research (both basic and clinical), present and publish the outcome at various scientific conferences and journals, both national and international.

b. SKILLS:

Take history, conduct clinical examination including all diagnostic procedures to arrive at diagnosis at the individual level and conduct survey of the community at a state and national level of all conditions related to oral health to arrive at community diagnosis. Plan and perform all necessary treatment , prevention, and promotion of Oral Health at the individual and community level. Plan appropriate Community Oral Health Programme, conduct the programme and evaluate, at the community level. Ability to make use of knowledge of epidemiology to identify causes and plan appropriate preventive and control measures. Develop appropriate person power at various levels and their effective utilization. Conduct survey and use appropriate methods to impart Oral Health Education Develop ways of helping the community towards easy payment plan, followed by evaluation of their oral health care needs. Develop the planning, implementation, evaluation and administrative skills to carry out successful Community oral Health programmes

c. ATTITUDE:

Adopt ethical principles in all aspects of Community Oral Health activities. To apply ethical and moral standards while carrying out epidemiological research. Develop communication skills, in particular to explain the causes and prevention of oral health diseases to the patient. Be humble and accept the limitations in his knowledge and skill and to ask for help from colleagues when needed and promote teamwork approach. Respect patient's rights and privileges including patient's right to information and right to seek a second opinion

d. INTEGRATION:

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

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**

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 - 60 hours
Clinical hours -200 hours

5. **TEACHING METHODOLOGY**

Lectures
Group discussion

6. **THEORY SYLLABUS**

TOPIC	MUST KNOW	DESIRABLE TO KNOW	NICE TO KNOW
Introduction to Dentistry	Definition of Dentistry, History of dentistry. Scope, aims and objectives of Dentistry		
Public Health	Health & Disease:- Concepts, Philogophy, Definition and Characteristics Public Health:-Definition, Concepts, History of public health, General	Screening of disease. Public Health Administration:- Priority,Establishment, Manpower, private Practice Management, Hospital management	Nutrition in oral diseases Behavioural science: Definition of sociology, anthropology and psychology and their relevance in dental practice and community.
	Epidemiology: - Definition, objectives, methods Environmental Health: - Concepts, principles, protection, sources, purification, environmental sanitation of water, disposal of waste, sanitation, role in mass disaster Health care delivery system: Centre and state, oral health policy, primary health care, national programmes, health organisations.	Ethics and Jurisprudence: Professional liabilities, negligence, malpractice, consents, evidence, contracts and methods of identification in forensic dentistry Health Education: - Definition, concepts, principles, methods, and health education aids	
Dental Public Health	Definition and difference between community and clinical health. Epidemiology of dental diseases-dental caries, periodontal diseases, malocclusion, dental fluorosis ,oral cancer & TMJ		

	Survey procedures: Planning, implementation and evaluation, WHO oral health survey methods 1997, indices for dental diseases.		
	Delivery of dental care: Dental auxiliaries, operational and non-operational, incremental and comprehensive healthcare, school dental health. Payments of dental care: Methods of payments and dental insurance, Government plans Preventive Dentistry-definition, Levels, role of individual ,Community and .profession, fluorides in dentistry, plaque control programmes.		
Bio Statistics	Bio Statistics: - Introduction, collection of data, presentation of data, Measures of Central tendency, measures of dispersion, Tests of significance, Sampling and sampling techniques -types, errors, bias, blind trials and calibration.		
Research Methodology	Research Methodology: -Definition, types of research, designing a written protocol		
Health Information	Health Information: - Basic knowledge of Computers, MS Office, Window 2000, Statistical Programmes		
Practice Management	Dentist Act 1948 Dental Council of India Indian Dental Association	Maintenance of records/accounts/audit. Consumer Protection Act.	Place and locality Premises & layout

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/CLINICALS/FIELD PROGRAMME IN PUBLIC HEALTH DENTISTRY**

These exercises designed to help the student in IV year students:

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

Exercises:

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

I. Complete Case History
Index:

1. Oral -hygiene indices simplified and origional- Green and Vermilion
2. Plaque index by Silness and Loe
3. Gingival Index by Loe and Silness

4. Periodontal Index- CPI and Russel
5. Dental Caries index: DMF: T and S, df: t and s
6. Fluorosis index by Dean

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

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

Attendance requirement, Progress and Conduct
75% in theory and 75% in practical/clinical in each year .

METHODS OF EVALUATION:

Evaluation may be achieved by the following tested methods:
1. Written test
2. Practicals
3. Clinical examination
4. Viva voce

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

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

Total Marks 70 Marks
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9. PRACTICAL AND CLINICAL EXAMINATION:
Practical & Clinical Evaluation:

Complete case history with two Oral indices - 90 marks

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 three months.

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**

1. Dentistry dental practice and community by David F. Striffler and Brain A. Burt . Edn- 983 W. B. Saunders company
2. Principles of Dental public health by James Morse Dunning, IV Edition 1986,Harward University Press.
3. Dental public health and community Ed by Anthony Jong Publication by the C.V.Mosby company 1981

4. Community oral health A –system approach by Patricia P. Cormier and Joyce I. Levy published by Appleton-century-Crofts/New York,1981
5. Community dentistry – A problem oriented approach by P.C. Dental Hand book series vol .8. by Stephen L. Silverman and Ames F. Tryon, series editor –Alvin F Gardener, PSG Publishing company Inc. Littleton Massachusetts , 1980
6. Dental public health- An introduction to public health dentistry. Edition by Geoffrey L. Slack and Brain Burt Published by John Wright and sons Bristol,1980.
7. Oral health surveys – Basic methods ,2013 Published by WHO GENEVA available at the regional office New Delhi
8. Preventive Medicine and Hygiene – By Maxcy and Rosenau , Published by Appleton century crofts , 1986
9. Preventive Dentistry – By J.O. Forrest published by John Wright and Sons Bristoli ,1980
10. Preventive Dentistry by Murray , 1997
11. Introduction to Bio- statistics By B.A.Mahajan
12. Research Methodology and Bio statistics .
13. Introduction to statistical methods By Grewal.
14. Text Book of Preventive and social Medicine by Park and park, 24th edition
15. Community Dentistry by Dr.Soben Peter. 5th Edition

13. REFERENCE BOOKS:

1. Dentistry Dental Practice and Community by David F. Striffler and Brian A. Burt, Edn. -1983, W.B.Saunders company
2. Principles of Dental Public Health by James Morse Dunning, IV Edition , 1986, Harvard University Press.
3. Dental Public Health and Community Dentistry Ed by Anthony Jong publication by The C.V. Mosby Company 1981.
4. Community Oral Health- A system approach by Patricia P.Cormier and Joyce I.Levy published by Appleton – Century – Crofts/New York, 1981
5. Community Dentistry – A problem oriented approach by P.C. Dental hand book series Vol 8 by Stephen L. Silverman and Ames F. Tryon, Series editor-Alvin F. Gardner, PSG Publishing company Inc.Littleton Massachuseltts, 1980.
6. Dental Public Health – An Introduction to Community Dentistry, Editted by Geoffrey L. Slack and Brian Burt, Published by John Wright and sons Bristol, 1980.
7. Oral Health Surveys – Basic Methods, 4th edition, 1997, Published by W.H.O. Geneva Available at the regional office New Delhi.
8. Preventive Medicine and Hygiene – By Maxcy and Rosenau, published by Appleton Century Crofts, 1986.
9. Preventive Dentistry – by J.O. Forrest published by John Wright and sons Bristol, 1980.
10. Preventive Dentistry by Murray, 1997.

11.Text Book of Preventive and Social Medicine by Park and Park, 14th edition.
12. Community Dentistry by Dr. Soben Peter.
13. Introduction to Bio-statistics by B.K. Mahajan
14. Research methodology and Bio-statistics
15. Introduction to Statistical Methods by Grewal.

14. CRI POSTING SCHEDULE AND ORIENTATION

1. The internees shall conduct health education sessions for individuals and groups on oral health public health nutrition, behavioral sciences, environmental health, preventive dentistry and epidemiology.

2. They shall conduct a short term epidemiological survey in the community, or in the alternate, participate in the planning and methodology.
3.They shall arrange effective demonstrations of:
   a) Preventive and interceptive procedures for prevalent dental diseases.
   b) Mouth-rinsing and other oral hygiene demonstrations -5Cases
   c) Tooth brushing techniques -5Cases
4. Conduction of oral health education programmes at
   A) School setting 2
   B) Community setting 2
   C) Adult education programmes 2
5. Preparation of Health Education materials 5
6. Exposure to team concept and National Health Care systems:
   a) Observation of functioning of health infrastructure.
   b) Observation of functioning of health care team including multipurpose workers male and female, health educators and other workers.
   c) Observation of atleast one National Health Programme.
   d) Observation of interlinkages of delivery of oral health care with Primary Health care. Mobile dental clinics, as and when available, should be provided for this teachings.

Period of Postings
Community Dentistry / Rural Services – 3 months