SYLLABUS AND CURRICULUM

BDS DEGREE COURSE

JAMIA MILLIA ISLAMIA, NEW DELHI-110025

PREFACE

The Bachelor of Dental Surgery (BDS) course syllabus has been revised by the faculty of the concerned specialties in order to

1. Make the dental students capable of practicing dentistry independently in both an urban as well as a rural setting
2. Provide education along with extensive training in clinical dentistry in the dental college hospital as well as in a community setting.
3. Develop integrated teaching and reduce compartmentalization of specialties so as to achieve horizontal and vertical integration in the curriculum.
4. Encourage the use of such teaching methodology which encourages the development of clarity of expression, independent judgment, scientific habits, problem solving abilities, self initiated and self-directed learning.
5. Use of learning methodologies like group discussions, seminars, role play, field visits, demonstrations, peer interactions etc., which help to improve soft skills through holistic development of students.

The BDS graduates of Jamia Millia Islamia are expected to acquire adequate knowledge, necessary skills and empathetic attitudes required for 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)

(Subject to changes and amendments in DCI Regulations)

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Comments / Feedback are welcome if any and mail it to fdn@jmi.ac.in

BDS DEGREE COURSE

1. GENERAL ANATOMY INCLUDING EMBRYOLOGY AND HISTOLOGY

A) GOAL

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

B) OBJECTIVES

i) KNOWLEDGE & UNDERSTANDING:

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

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

ii) SKILLS

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

C) ATTITUDE

Willingness to apply present understanding of dentistry to the best interests of the patient and also to raise aware ness and provide potential alternatives to oral health issues across the society.

D) INTEGRATION

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

1. Lectures & small group teaching
2. Demonstrations
3. Dissection of the human cadaver
4. Study of dissected specimens
5. Osteology
6. Surface anatomy on living individual
7. Study of radiographs & other modern imaging techniques.
8. Study of histology slides.
9. Study of embryology models and charts
10. Audio-visual aids
11. Knowledge about asepsis – Disinfection and sterilization of instruments, clinical area / personal care in accordance with universal protection and disposal of medical waste in the suitable manner. Students should be conscious of the laws and regulations governing the maintenance of clinical facilities and the disposal of waste.

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

E) TEACHING HOURS

Lecture Hours - 100 hrs
Practical Hours - 175 hrs
Total -275 hrs

F) TEACHING METHODOLOGY

1. Combination of Lectures
2. Small group seminars, tutorials
3. Dissection and learning from dissected specimens
4. Microscopic demonstration
5. Audio visual aids

6. Demonstration of articulated and individual bone specimens.
7. Use of workbook for practical classes
8. Drawing histology diagrams in record notebook
9. Surface anatomy on living individual
10. Study of radiographs & other modern imaging techniques.
11. Study of Histology slides.
12. Study of embryology models.

G) AN OUTLINE OF THE COURSE CONTENT

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

H) FURTHER DETAILS OF THE COURSE

I. General Anatomy

Definitions and interpretation of anatomical terms, anatomical planes, anatomical positions
Bones- Classification, parts, blood and nerve supply, ossification
Joints - Definition and classification, axes of movements
Muscles - Classification according to Structure and action, parts of skeletal muscles
CVS - Types of blood vessels, pulmonary and systemic circulation, venous return, thrombosis and infarction
Lymphatic system - Components and function of lymphatic system
Nervous system - Subdivision of nervous system, somatic and autonomic system, neuroglia

2. Osteology of Head & Neck

Skull – external features seen in norma frontalis, verticalis, occipitalis, lateralis and basalis
Interior - Cranial fossae -subdivisions, foramina and structures passing through them

Individual bones - mandible, maxilla, frontal, parietal, occipital, temporal, zygomatic, ethmoid, sphenoid, vomer, palatine, nasal bones, Hyoid bone, Cervical vertebrae

3. Gross Anatomy of Head and Neck

Scalp - layers, blood supply, nerve supply, lymphatic drainage

Face – Muscles of facial expression, blood supply, nerve supply, lymphatic drainage, lacrimal apparatus

Neck- Cervical fascia, sternocleidomastoid muscle–attachments, relation, nerve supply & applied

Posterior triangle - boundaries and contents of subclavian and occipital triangle

Anterior triangle - boundaries and subdivision of anterior triangle, contents and boundaries of submental, digastric, carotid & muscular triangles

Cranial cavity – meninges, dural folds and sinuses, hypophysis cerebri

Orbit - nerves, vessels, extrinsic muscles of eyeball, ciliary ganglion

Parotid region - parotid gland-parts, borders, surfaces, contents, parotid duct, relations and nerve supply

Temporal and infra-temporal fossae - muscles of mastication, Maxillary artery, maxillary and mandibular nerve, temporo-mandibular joint

Submandibular region - submandibular salivary gland- parts, borders, surfaces, contents, submandibular duct, relations and nerve supply

Vessels of head & neck - Carotid, subclavian arteries, internal jugular vein, lymphatic drainage of head & neck

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, tonsillitis, tonsillectomy, paratonsillar abscess, adenoids

Tongue - Names, nerve supply and actions of extrinsic and intrinsic muscles of tongue, nerve supply and lymphatic drainage of tongue

Larynx - Names, nerve supply and actions of intrinsic and extrinsic muscles of larynx, cartilages and ligaments, sensory innervation and blood supply of larynx

Joints of neck - atlanto – occipital &atlanto-axial joint

Deep structures in the neck-Thyroid and parathyroid glands -location, parts, borders, surfaces, relations, vascular and nerve supply. Trachea- parts, tracheostomy. Oesophagus

Nasal cavity – nasal septum, lateral wall of nose, para-nasal air sinuses, epistaxis.

4. Neuroanatomy:

External features of the brain and spinal cord and its meningeal coverings
Spinal cord - External and internal features, spinal segment and dermatome, organization of grey matter, ascending and descending tracts and their functions, upper and lower motor neurons,
Brainstem - External and internal features
Cerebellum - Gross features and subdivisions of cerebellum, deep nuclei, afferent and efferent connections, cerebellar peduncles
Cerebrum - Gross features (gyri and sulci) of the cerebral hemisphere – superolateral, medial and inferior surface and the subdivisions into lobes. Functional areas and Brodmann's numerals (motor, sensory, visual, auditory, speech, frontal eye field, prefrontal cortex)
Horizontal and midsagittal section of cerebrum
Detailed description of cranial nerves - V, VII, IX, X ,XI, XII including their nuclei of origin, intra and extra cranial courses
Cervical spinal nerves and cervical plexus
Autonomic nervous system of head and neck
Ventricles of the brain
Blood supply of brain and spinal cord

5. Thorax:
   Demonstration on a dissected specimen
   Thoracic wall, heart chambers, coronary arteries, pericardium, lungs – surfaces, pleural cavity, diaphragm

6. Abdomen:
   Demonstration on a dissected specimen
   Peritoneal cavity, organs in the abdominal & pelvic cavity

7. Clinical Procedures:
   Intramuscular injections: Demonstration on a dissected specimen and on a living person of the following sites of injection.
   1. Deltoid muscle and its relation to the axillary nerve and radial nerve.
   2. Gluteal region and the relation of the sciatic nerve.
   3. Vastus lateralis muscle.

Intravenous injections & venesection: Demonstration of veins in the dissected specimen and on a living person.

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

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

1. Superficial temporal
2. Facial
3. Carotid
4. Radial
5. Femoral

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

8. Embryology:

Gametogenesis - spermatogenesis and oogenesis, uterine and ovarian cycles, fertilisation implantation, germ layer formation, fetal membranes and placenta. amnion and umblical cord

Development of branchial apparatus, pharyngeal arches, pouches and clefts.

Development of face, jaws, oral cavity, tongue, palate, nasal cavity, paranasal air sinuses, salivary glands, thyroid gland, hypophysis cerebri, temporo-mandibular joint, tooth development in brief

Birth defects- facial clefts,Ist arch anomalies,developmental anomalies of tongue, branchial cysts and fistulae, ectopic thymus or thyroid or parathyroid tissue, thyroglossal cyst

9. Genetics - definitions, Mitosis, meiosis, chromosomes-structural and classification, karyotyping,
chromosomal aberration, syndromes, gene structure, Mendelism, modes of inheritance

10. Histology:

Introduction of cytology and histology,

The Cell : Basic tissues - Epithelium, Connective tissue cells and fibres, areolar tissue

Epithelium - simple squamous, simple cuboidal, simple columnar, ciliated columnar Epithelium, pseudo-stratified ciliated columnar, compound stratified squamous kertinised, stratified squamous non keranised, transitional
Cartilage hyaline, elastic, white fibro cartilages and bone, Spongy and compact bones
Muscular tissue - skeletal, cardiac and smooth
Nervous tissue : Peripheral nerve, optic nerve, sensory ganglion, motor ganglion,
Skin
Classification of Glands Salivary glands (serous, mucous and mixed gland),
Blood vessels,
Lymphoid tissue - lymph node, palatine tonsil, thymus & Spleen
Tongue, oesphagus, stomach, ,duodenum ,ileum, colon, vermiform appendix Liver, Pancreas,
Lung, Trachea
Endocrine glands - Thyroid gland , para thyroid gland , supra renal gland and pituitary gland,
Kidney, ureter, urninary bladder, ovary and testis.

11.Dissection Topics:

Scalp, Face including deeper dissection, Posterior triangle of neck, Anterior triangles of neck -median region, digastric, carotid triangles
Deep dissection of neck - Thyroid gland, great vessels of neck,
Parotid region, Infra temporal fossa - Muscles of mastication, Mandibular nerve and its branches, maxillary artery, temporo-mandibular joint
Sub mandibular region - gland, hyoglossus and its relations, mouth, palate and pharynx
Nasal cavity and paranasal air sinuses, tongue, larynx

12. Surface Anatomy:

Superior sagittal sinus, middle meningeal artery, pterion, facial artery, parotid gland and duct, facial nerve on face, common, external, internal carotid arteries, palatine tonsil, vocal cords, thyroid gland, External Jugular vein

13. Radiological Anatomy:

AP & Lateral views of head and neck.

14. Demonstration of specimens:

Thoracic wall, chambers of heart and coronary arteries, pericardium, lungs-pleural cavity, diaphragm Abdomen, peritoneum, organs in abdominal and pelvic cavities

I) 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.

J) 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.

K) SCHEME OF EXAMINATION:

Distribution of marks in University Examination

Theory				Practical			
University paper	Viva voca	Internal assessment	Total	University examination	Internal assessment	Total	Grand total
70	20	10	100	90	10	100	200

Theory examination (3 Hours)

Question paper shall be of 3 hours duration& divided into two parts – Part A& Part B, carry equal marks of 35 each. There shall be three types of questions with distribution of marks as shown in Table:

Type of question	No of questions	Marks of questions	Total marks
Long essay type	2	8	16

Short essay type	6	5	30
Short notes (Enumeration/Clinical reasoning)	8	3	24
Grand total			70

Practical examination

Internal Assessment

The internal assessment comprises of written & practical tests, maintenance of records, participation in seminars and group discussions. These will be evaluated objectively and recorded. The weighting provided to internal assessment is 10 percent of the total marks allocated separately for the theory and practical examinations.

Record /log book/practical book

The students should maintain the practical file and get it evaluated periodically by faculty

Part A

Head & Neck = 25 Marks.
Other Regions of the body = 05 Marks
(General anatomy, Upper limb, Thorax)

Embryology & Genetics = 05 Marks.

Head and Neck

Scalp - layers, blood supply, nerve supply, lymphatic drainage
Face – Muscles of facial expression, blood supply, nerve supply, lymphatic drainage, lacrimal apparatus
Neck- Cervical fascia, sternocleidomastoid muscle–attachments, relation, nerve supply & applied

Posterior triangle - boundaries and contents of subclavian and occipital
triangle
Anterior triangle - boundaries and subdivision of anterior triangle, contents and boundaries of submental, digastric, carotid & muscular triangles
Cranial cavity – meninges, dural folds and sinuses, hypophysis cerebri
Detailed description of cranial nerves - V, VII, IX, X ,XI, XII including their nuclei of origin, intra and extra cranial courses
Orbit - nerves, vessels, extrinsic muscles of eyeball, ciliary ganglion
Parotid region - parotid gland-parts, borders, surfaces, contents, parotid duct, relations and nerve supply
Vessels of head & neck - Carotid, subclavian arteries, internal jugular vein, lymphatic drainage of head & neck
Joints of neck - atlanto – occipital &atlanto-axial joint
Deep structures in the neck-Thyroid and parathyroid glands -location, parts, borders, surfaces, relations, vascular and nerve supply. Trachea- parts, tracheostomy. Oesophagus

Part B

Head & Neck = 20 Marks.
Other Regions of the body = 10 Marks
(Abdomen, Lower Limb, Nervous system)

Histology = 05 Marks

Head & Neck

Skull – external features seen in norma frontalis, verticalis, occipitalis, lateralis and basalis
Interior - Cranial fossae -subdivisions, foramina and structures passing through them
Individual bones - mandible, maxilla, frontal, parietal, occipital, temporal, zygomatic, ethmoid, sphenoid, vomer, palatine, nasal bones, Hyoid bone, Cervical vertebrae
Temporal and infra-temporal fossae - muscles of mastication, Maxillary artery, maxillary and mandibular nerve, temporo-mandibular joint
Submandibular region - submandibular salivary gland- parts, borders, surfaces, contents, submandibular duct, relations and nerve supply

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Tongue - Names, nerve supply and actions of extrinsic and intrinsic muscles of tongue, nerve supply and lymphatic drainage of tongue

Larynx - Names, nerve supply and actions of intrinsic and extrinsic muscles of larynx, cartilages and ligaments, sensory innervation and blood supply of larynx

Nasal cavity – nasal septum, lateral wall of nose, para-nasal air sinuses, epistaxis

L) TEXT BOOKS:

Gross Anatomy

- Gray's Anatomy 41st Edition 2016 Standring S.
- SNELL (Richard S.) Clinical Anatomy for Medical Students, Ed. 5, Little Brown &company,Boston.
- RJ LAST'S Anatomy- McMinn, 9th edition.
- ROMANES(G.J.) Cunningham Manual of Practical Anatomy: Head & Neck & Brain Ed.15. VOL. III, Oxford Medical Publication.
- Clinical Oriented Anatomy 7th edition by Moore KL, Agur AMR and Dalley AF.
- Textbook human anatomy(Head and Neck), Inderbir Singh.
- A Textbook of Human Anatomy, 2000 by T.S. Ranganathan.
- Grant's Atlas of Anatomy, James E Anderson, Williams & Wilkins.

Neuroanatomy

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

Histology

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

- Textbook of Histology 2008 by GP Pal

Embryology

- Langman's Medical Embryology 13th edition by T.W. Sadler.
- Larsen's Human Embryology 5th Edition 2014 by Schoenwolf, Bleyl, Brauerand Francis-West.
- The Developing Human: Clinically Oriented Embryology 9th edition, 2012 by Keith L. Moore.
- Human Embryology 10th edition by IB Singh
- Emery Medical Genetics

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 functioning of different organs of the body, to facilitate an understanding of health and diseases of the human beings.

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 parts of the human body .

ii. Should be able to understsnd the physiological basis of the underlying pathology and treatment of diseases.

b. SKILLS:

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

i. Conduct various experiments to show the normal functioning of the body.

ii. Interpret experimental and investigative data

iii. Distinguish between' normal and abnormal results of tests which are performed and observed in the laboratory.

c. ATTITUDE:

To develop an attitude of self learning and the importance of deep learning.

d. INTEGRATION:

Student shall acquire an integrated knowledge of Anatomy, Physiology and Biochemistry of different systems of the body.

e. KNOWLEDGE ABOUT INFECTION AND CROSS INFECTION IN DENTISTRY

Students should be aware of the rules and regulations pertaining to disposal of waste products in the lab.

3. **COMPETENCIES**

i. General skills:

□□Apply knowledge& skills in day to day life.
□□Apply principles of ethics.
□□Participate and involve in professional bodies
□□Involvement in simple research projects
□□Minimum computer proficiency to enhance knowledge and skills
□□Refer patients for consultation and specialized treatment
□□Practice within the scope of one's competence

iii. Communication skills

- to improve communication skills by active participation in class rooms , quiz,seminars etc

PATIENT CARE :

- Obtaining patient's .history in a methodical way
- Performing thorough clinical examination
- Ability to order appropriate investigations
- Recognition and initial management of medical emergencies that may occur during dental treatment
- Perform basic cardiac life support

4. TEACHING HOURS

Lecture Hours – 120 hour

- General Physiology - 6 hours
- Blood - 18 hours
- Muscle and Nerve - 8 hours
- Gastrointestinal tract - 10hours
- Excretion, Body temperature and functions of skin - 9 hours
- Endocrinology - 14 hours
- Reproduction - 7 hours
- Cardiovascular system - 12 hours
- Respiratory system - 10 hours
- Central Nervous system - 18 hours
- Special senses - 8 hours

Practical Hours – 60 hours

5. TEACHING METHODOLOGY

Teaching of General human Physiology can be achieved by various teaching methods such as:

a) Lectures
b) Demonstrations in Lab
c) Lab experiments
d) Audio visual aids
e) Seminar & Small group discussions with regular feed back from the students
f) Integrated Teaching
g) continuing medical and dental education programmes

6. THEORY SYLLABUS

1. Introduction to Physiology:

- The Cell and General Physiology
- Functional Organization of theHuman Body and Control of the"Internal Environment"
- The Cell and Its Functions

2. Membrane Physiology, Nerve and Muscle

- Transport of Substances Through the Cell Membrane
- Membrane Potentials and Action Potentials
- Contraction of Skeletal Muscle
- Excitation of Skeletal Muscle: Neuromuscular Transmission andExcitation-Contraction Coupling
- Contraction and Excitation of Smooth Muscle

3. The Heart

- Heart Muscle; The Heart as a Pump and Function of the Heart Valves
- Rhythmical Excitation of the Heart

- The Normal Electrocardiogram
- Cardiac Arrhythmias and Their Electrocardiographic Interpretation
- The Circulation
- Vascular Distensibility and Functions of the Arterial and Venous Systems
- The Microcirculation and theLymphatic System: Capillary FluidExchange,InterstitialFluid, andLymph Flow
- Local and Humoral Control of Blood Flow by the Tissues
- Nervous Regulation of the Circulation and Rapid Control of Arterial Pressure
- Dominant Role of the Kidney in Long-Term Regulation of Arterial Pressure and in Hypertension
- Muscle Blood Flow and CardiacOutput During Exercise
- Ischemic Heart Disease
- Cardiac Failure
- Heart Valves and Heart Sounds
- Circulatory Shock and Physiology of Its Treatment

4. The Body Fluids and Kidney

- The Body Fluid Compartments: Extracellular and Intracellular Fluids; Interstitial Fluid and Edema
- Urine Formation by the Kidneys:
  I. Glomerular Filtration, Renal BloodFlow, and Their Control
  II. Tubular Processing of the Glomerular Filtrate
- Regulation of Extracellular FluidOsmolarity and Sodium Concentration
- Renal Regulation of Potassium,Calcium, Phosphate, and Magnesium;Integration of Renal Mechanisms forControl of Blood Volume andExtracellular Fluid Volume
- Regulation of Acid-Base Balance
- Kidney Diseases and Diuretics

5. Blood Cells, Immunity, and Blood Clotting

- Red Blood Cells, Anemia, andPolycythemia

- Resistance of the Body to Infection: I.Leukocytes, Granulocytes, theMonocyte-Macrophage System, and Inflammation II.Immunity and Allergy
- Blood Types; Transfusion; Tissue and Organ Transplantation
- Hemostasis and Blood Coagulation

6. Respiration

- Pulmonary Ventilation
- Pulmonary Circulation, Pulmonary Edema, Pleural Fluid
- Physical Principles of Gas Exchange;Diffusion of Oxygen and CarbonDioxide Through the RespiratoryMembrane
- Transport of Oxygen and Carbon Dioxide in Blood and Tissue Fluids
- Regulation of Respiration
- Respiratory Insufficiency—Pathophysiology, Diagnosis, OxygenTherapy
- Deep-SeaDiving Physiology
  , High-Altitude Physiology

7. The Nervous System:

- Organization of the Nervous System, Basic Functions of Synapses,
  "Transmitter Substances"

- Sensory Receptors, Neuronal Circuits for Processing Information
- Somatic Sensations: I. General Organization, the Tactile and Position Senses
- Somatic Sensations: II. Pain,Headache, and Thermal Sensations
- The Special Senses
  The Eye: I. Optics of Vision
  The Eye: II. Receptor and Neural Function of the Retina
  The Eye: III. Central Neurophysiology of Vision
  The Sense of Hearing
  The Chemical Senses—Taste and Smell

- Motor and Integrative Neurophysiology
- Cortical and Brain Stem Control of Motor Function
- Contributions of the Cerebellum and Basal Ganglia to Overall Motor Control
- Cerebral Cortex, Intellectual Functions of the Brain, Learning and Memory
- Behavioral and Motivational Mechanisms of the Brain—The Limbic System and the Hypothalamus
- States of Brain Activity—Sleep, Brain Waves, Epilepsy
- The Autonomic Nervous System and the Adrenal Medulla
- Cerebral Blood Flow, Cerebrospinal Fluid, and Brain Metabolism

8. Gastrointestinal Physiology

- General Principles of Gastrointestinal Function—Motility, Nervous Control, and Blood Circulation
- Propulsion and Mixing of Food in the Alimentary Tract
- Secretory Functions of the AlimentaryTract
- Digestion and Absorption in the Gastrointestinal Tract
- Physiology of Gastrointestinal Disorders
- Metabolism and TemperatureRegulation
- The Liver as an Organ
- Dietary Balances; Regulation ofFeeding; Obesity and Starvation
- Energetics and Metabolic Rate
- Body Temperature, Temperature Regulation, and Fever

9. Endocrinology and Reproduction Introduction to Endocrinology

- Pituitary Hormones and Their Control by the Hypothalamus
- Thyroid Metabolic Hormones
- Adrenocortical Hormones
- Reproductive and HormonalFunctions of the Male (and Functionof the Pineal Gland
- Insulin, Glucagon, and DiabetesMellitus
- Parathyroid Hormone, Calcitonin,Calcium and Phosphate Metabolism, Vitamin D, Bone,and Teeth
- Female Physiology Before Pregnancy and Female Hormones
- Pregnancy and Lactation

RECOMMENDED BOOKS:

FOR THEORY:

1) Textbook of Medical Physiology – by Guyton & Hall Latest edition
2) Review of Medical Physiology – by Ganong Latest edition
3) Human Physiology for BDS -- by Dr. A K Jain Latest edition

FOR PRACTICAL :

1) Manual of Practical Physiology -- by Dr. A K Jain Latest edition

SCHEME OF TEACHING:

THEORY

1. Lectures
2. Tutorials
3. Group discussions
4. Theory exams and viva

PRACTICAL

1) Instructions before starting the practicals in lab
2) Procedure of the practical
3) Demonstration
4) Students do the practical under the supervision of the teacher
5) Practical exam and viva

HOURS OF TEACHING:

1. Theory: 160 hours per year
2. Practical: 80 hours per year

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

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.General and systemic clinical examination .

8**. THEORY EXAMINATION**

Long question 1 ×8 = 8 marks
Short notes 3 × 5 = 15 marks
Brief Answers 4 ×3 = 12 marks

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Total = 35 marks
_____

8. 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- 10 MARKS
Determination of Haemoglobin.
Determination of blood group.
Determination of, bleeding time and clotting time.

SPOTTING - 10 MARKS
MANUAL/RECORD BOOK – 5 MARKS
Examination Internal Assessment – 5 MARKS

TOTAL PRACTICAL – 50 MARKS

Theory- 35
Grand Viva – 10
Internal Assessment -5
TOTAL THEORY - 50 MARKS

3. BIOCHEMISTRY AND NUTRITION

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. Clinical biochemistry is a special branch of medicine dealing with measurement and interpretation of the physicochemical condition and dynamics in healthy and diseased humans, thus contributing to a pathophysiological understanding and thereby to prophylaxis, diagnosis, therapy, prognosis and research of diseases at the cellular and molecular level. Many diseases show significant changes in the chemical composition of body fluids such as the elevated blood enzymes due to their release from heart muscles after a heart attack, or a raised blood sugar in diabetes mellitus due to lack of insulin or defect in some metabolic pathway for the utilization of glucose. Clinical biochemistry uses a broad range of analytical techniques such as molecular diagnostics, measurement of enzyme activities, spectrophotometry, electrophoresis, separation of molecules based on physical characteristics and immunoassays for quantitative determination of substrates, enzymes, and electrolytes in human serum, plasma, or urine. Large amount of knowledge generated by clinical biochemistry is now being accepted into clinical practice across medical and surgical disciplines. Clinical chemistry and biochemistry also became an important contributor to the development and monitoring of the nutritional status of an individual including intravenous nutrition. An important methodological development was also the point-of care testing: development of a range of portable or small desktop analyzers and dry reagent test strips, which allowed low-volume emergency testing in hospitals, or through self-testing by patients.

2. Objectives

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 in regulation of enzymatic activity;
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 and the associated pathology;
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 defense 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.

At the end of the course, the student should be able to understand the biochemical basis of the health and diseases. The student should be able to: make use of conventional techniques/instruments to perform biochemical analysis relevant to clinical screening and diagnosis; analyze and interpret investigative data; demonstrate the skills of solving scientific and clinical problems and decision making in dentistry. The knowledge acquired in biochemistry should help the students to integrate molecular events with structure and function of the human body. They will also be able to have an idea of bioethics and ethical practices.

3. Teaching and Practicals
Teaching methodology

Lectures, tutorials, seminars, small group discussions, integrated teaching modules, use of charts (paper-based clinical scenarios), practical exercises and demonstrations. Use of ICT tools such as smart boards, projectors, powerpoint presentation, etc. are also used by the teachers for academic and teaching purpose.

4. Theory Syllabus in detail:

a) Chemistry of Bio-Organic Molecules: ***Carbohydrates:*** Definition, biological importance and classification. Monosaccharides - isomerism, anomerism. Sugar derivatives, disaccharides. Polysaccharides: structures of starch and glycogen.

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

Proteins: Biological importance. Aminoacids: Classification. Introduction to peptides. Simple and conjugated proteins; globular and fibrous. Charge properties, buffer action. Introduction to protein conformation. Denaturation.

Nucleic acids: Building units, nucleotides. Outline structure of DNA and RNA. High energy compounds: ATP,

phosphorylamidines, thiolesters, enol phosphates.

b) Macronutrients and Digestion: Energy needs: Basal metabolic rate. Dietary carbohydrates, fibres. Dietary lipids, essential fatty acids. Nitrogen balance, essential amino acids, protein quality and requirement. Protein calorie malnutrition. Balanced diet. Enzymatic hydrolysis of dietary carbohydrates. Mechanism of uptake of monosaccharides. Digestion and absorption of triacylglycerols. Enzymatic hydrolysis of dietary proteins and uptake of amino acids.

c) Micronutrients: ***Vitamins:*** Definition, classification, daily requirement, sources and deficiency symptoms. Brief account of water-soluble vitamins with biochemical functions. Vitamins A functions including visual process. Vitamin D and its role in calcium metabolism. Vitamin E. Vitamin K and gamma carboxylation.
Minerals: Classification, daily requirement. Calcium and phosphate: sources, uptake, excretion, function. Serum calcium regulation. Iron: sources, uptake and transport. Heme and nonheme iron functions; deficiency. Iodine: Brief introduction to thyroxine synthesis. General functions of thyroxine. Fluoride: function, deficiency and excess.

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

e) Special Aspects of Metabolism: Importance of pentose phosphate pathway. Formation of glucuronic acid. Outlines of cholesterol synthesis and breakdown. Ammonia metabolism. Urea formation. Phosphocreatine formation. Amines. Introduction to other functions of amino acids including one carbon transfer.

f) Biochemical genetics and protein synthesis: Introduction to nucleotides; formation and degradation. DNA as genetic material. Introduction to replication and transcription. Forms and functions of RNA. Genetic code and mutation. Outline of translation process. Antimetabolites and antibiotics interfering in replication, transcription and translation. Introduction to cancer, viruses and oncogenes.

g) **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.
Hormones: Introduction to second messengers, cyclic AMP, calcium ion, inositol triphosphate. Mechanism of action of steroid hormones, epinephrine, glucagon and insulin in brief.

h) **Structural Components and blood proteins:** ***Connective tissue:*** Collagen and elastin. Glycosaminoglycans. Bone structure. Structure of membranes. Membrane associated processes in brief. Exocytosis and endocytosis. Introduction to cytoskeleton. Muscle proteins.
Hemoglobin: Functions. Introduction to heme synthesis and degradation.
Plasma proteins: Classification and separation. Functions of albumin. A brief account of immunoglobulins. Plasma lipoproteins: formation, function and turnover.

i) **Medical Biochemistry:** Regulation of blood glucose. Diabetes mellitus and related disorders. Evaluation of glycemic status. Hyperthyroidism and hypothyroidism. Hyperlipoproteinemias and atherosclerosis, Approaches to treatment. Jaundice: Classification and evaluation. Liver function tests: Plasma protein pattern, serum enzymes levels. Brief introduction to kidney function tests. Gastric function tests. Acid base imbalance. Electrolyte imbalance: evaluation. Gout. Examples of genetic disorders including lysosomal storage disorders, glycogen storage disorders, glucose 6- phosphate dehydrogenase deficiency, hemoglobinopathies, Inborn errors of amino acid metabolism and muscular dystrophy. Serum enzymes in diagnosis.

5. Main / Representative Practicals:

1. Safety precautions in a biochemistry laboratory
2. Labwares in a biochemistry laboratory
3. Qualitative analysis of carbohydrates
4. Colour reactions of proteins and amino acids
5. Determination of non protein nitrogen substances
6. Normal constituents of urine
7. Abnormal constituents of urine
8. Analysis of saliva including amylase
9. Analysis of milk, quantitative estimations

10. Blood glucose estimation
11. Serum total protein estimation
12. Demonstration and Charts: discussion of clinical case scenarios/clinical data evaluation

Practical Record

A practical manual has been developed by the department containing the practicals and protocols to be performed by the BDS students. It is given to the students at the beginning of the session for their understanding and reference. The students also make and maintain a record of the practical done in the laboratory class in a separate practical notebook. It is routinely checked and assessed by the teachers taking the practical classes.

6. Internal Assessment / sessional tests:

The continuing assessment examination (Theory/Practical) is held three times in a particular year and all examination marks are considered for final evaluation. The marks obtained by students are displayed on the notice board of the respective department and a copy of the marks are forwarded by the department to the university at the end of the year to be incorporated with the main university examination

7. Annual and Supplementary Examinations

Theory: 35 marks
Practical: 45 marks

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

8. Some Reference and Recommended Books :

1. Biochemistry for Dental Students (Avichal): SK Gupta.
2. Biochemistry for Dental Students (Elsevier): Dinesh Puri.

3. Concise Textbook of Biochemistry (All Indian Publishers and Distributers): TN Pattabiraman.
4. Harper's Illustrated Biochemistry (Lange): Murray, Bender, Botham, Kennelly, Rodwell and Weil.
5. Lehninger's Principles of Biochemistry (WH Freeman, MacMillan): Cox and Nelson.
6. Lippincotts' Illustrated Reviews, Biochemistry (Wolters Kluwer)
7. Textbook of Biochemistry for Medical/Dental Students (Jaypee): Vasudevan, Sreekumari and Vaidyanathan.
8. Textbook of Medical Biochemistry (Jaypee): Chatterjea and Shinde.

4. 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 using the best available evidence as per current knowledge and understanding of common oral diseases process; to employ reliable diagnostic modalities.

2. OBJECTIVES

- 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 oralbiology/ecology
- To develop a comprehension of the principles of embryogenesis and human development with emphasis on the face and structures of the oralcavity
- To understand, comprehend, describe, compare, and illustrate the histologic characteristics of oral tissues in health and diseasedstates
- To develop a professional vocabulary of terminology related to the head and neck, the oral complex, and the teeth so as to apply in clinicalscenario
- 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 lymphaticsystems.
- To identify the histologic and anatomic features of the extra-oral and intraoralstructures.
- To compare and contrast the human dentition in relationship to location, function, andmorphology
- To identify, comprehend, describe the sequence and eruption patterns of primary and permanent teeth and their implications on future oral and overallhealth
- To understand the oral physiology, unique biochemical basis behind of oral musculature, glands andmovements
- 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.

3. COMPETENCIES

i. General skills:

- Apply knowledge& skills in day to daypractice
- Apply principles ofethics
- Analyze the outcome oftreatment
- Evaluate the scientific literature and information to decide thetreatment
- Participate and involve in professionalbodies
- Self-assessment & willingness to update the knowledge & skills from time totime
- Involvement in simple researchprojects
- Minimum computer proficiency to enhance knowledge andskills
- Refer patients for consultation and specializedtreatment
- Basic study of forensic odontology and geriatric dental problems

ii. Skills specific to the subject

- 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

4. TEACHINGHOURS

Lecturehours – 105 hours Practical/clinical hours – 250hours

5. TEACHINGMETHODOLOGY

I. LECTURE
II. DEMONSTRATION
III. GROUPDISCUSSION
IV. SEMINAR PRESENTATION BY THESTUDENTS

6. THEORY SYLLABUS

TOPIC	MUST KNOW	DESIRABLE TO KNOW	NICE TO KNOW	Hours
Introduction to tooth morphology	➢ Human dentition : types and functions ➢ Notation systems : Palmer's, FDI system, Universal and Victor-Haderup system ➢ Anatomical landmarks on tooth surface ➢ Basic terminologies in dental anatomy ➢ Dental formula ➢ Trait categories of teeth ➢ Chronology of tooth development ➢ Form and function of oro-facial complex	Applied Anatomy. Clinical aspects of anatomical landmarks	Evolution of human dentition	8

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.	Applied Anatomy. Clinical aspects of anatomical landmarks		16
Morphology of deciduous teeth	➢ Difference between deciduous and permanent teeth ➢ Description of individual deciduous teeth, including their chronology and development ➢ Identification of individual deciduous teeth	Endodontic anatomy (pulpal and root canal anatomy)		3
Occlusion	➢ Definition, factors influencing occlusion – basal bon, arch, individual teeth, external and internal forces and sequence of eruption ➢ Inclination of individual teeth – compensatory curves ➢ Importance of Inter-dental spacing and terminal plane relationship in deciduous dentition	➢ Centric relation and centric occlusion – protrusive, retrusive and lateral occlusion ➢ Development of Occlusion	➢ Introduction to and classification of malocclusion ➢ Clinical significance of normal occlusion	6
Oral Embryology	Brief review of development of face, jaws, lips, palate and tongue with applied aspect	General Embryology, Facial clefts, including Cleft Lips and palate, developmental anomalies of Tongue	Relevant Syndromes and cysts	7

Development of teeth	➢ Epithelial mesenchymalinteraction, ➢ Detailed study of different stages of development of crown, root and supporting tissue of teeth and detailed study of formationof calcifiedtissues. ➢ Applied aspects of disorders in development of teeth. ➢ Exposure to microscopic slides	Deviation or aberration in tooth formation. Clinical aspects of tooth development	Molecular basis of tooth development.	7
Eruption of deciduous and permanent teeth	➢ Mechanisms in tootheruption ➢ Theories and histology of eruption. ➢ Clinical or applied aspect of disorders of eruption. ➢ Physiological tooth movement – Preeruptive, Eruptive and Posteruptive tooth movements	Clinical aspects of eruption		2
Shedding of teeth	➢ Factors and mechanism of sheddingof deciduousteeth □ Complications of shedding	Clinical aspects of shedding	Root resorption and resorptive cell	2

ORAL HISTOLOGY Enamel	➢ Detailed microscopic study ➢ Age changes ➢ Applied aspects of histological considerations	Forensic significance. Ameogenin, Ameloblastin Pellice (significance)	Fluoride applications (Fluorapatite Crystals and Caries Resistance) Etching Enamel Hypoplasia	6
Dentin	➢ Detailed microscopicstudy ➢ Dentinhypersensitivity ➢ Reaction of pulp tissue to varying insults on exposed dentin ➢ Clinical significance	Applied aspects of dentine	Forensic significance (specially translucent Dentine and dentine Matrix)	6

Cementum	➢ Detailed microscopic study ➢ Clinical significance ➢ Hypercementosis ➢ Repair	Cemental Pathosis (Hyper cementosis, Hypophosphatasia, Cementicles, Cemental Spurs)	Forensic significance	5
Pulp	➢ Detailed microscopic study ➢ Functions ➢ Age changes and Pulp calcification ➢ Clinical significance	Applied aspects of Pulp anatomy Forensic significance (including its role as a DNA source)	Pulp as a source of Stem cells Stem Cell banking Pulpal capping agents	5
Periodontal ligament and Alveolar bone	➢ Detailed microscopicstudy ➢ Functions ➢ Age changes Histological changes in periodontal ligament and bone in normal and orthodontic tooth movement	➢ Applied aspects of alveolar bone resorption ➢ Significance of Lamina dura in dental diagnosis	Current concepts of bone remodeling. PDL Pathosis Fenestration and Dehiscence	8
Oral mucosa	➢ Detailed microscopicstudy ➢ Variation in structure in relation to functionalrequirements ➢ Mechanisms of keratinisation ➢ Clinical parts ofgingiva ➢ Dentogingival and Mucocutaenous junctions ➢ Lingual papillae ➢ Age changes and clinical considerations	Gingival attachment and Gingival recession Periodontal Pocket	Molecular basis of oral tissues. Black Hairy and Geographic Tongue	8

Microscopy and Laboratory procedures in Oral Pathology	Grossing, hematoxylin and eosin staining, Grams Staining and PAP staining	Microscope and Laboratory maintenance.	Quality control and standardization of lab procedures Artifacts in microscopic sections	2
Salivary glands	➢ Detailed microscopic study of aciniand ductalsystem. ➢ Age changes and clinicalconsiderations.	Xerostomia	Mucoceles	4
TM Joint	➢ Review of basic anatomical aspects, microscopic study and clinicalconsiderations.			2
Tissue processing	➢ Familiarization with the process and techniques of tissue processing			1
ORAL PHYSIOLOGY Saliva	➢ Composition of saliva – variations, formation ofsaliva ➢ Functions ➢ Role of saliva in dental caries andapplied aspects of hyper and hyposalivation.	➢ Mechanism of secretion, salivary reflexes, brief review of secretomotor pathway		1
Mastication	➢ Masticatory muscles ➢ Masticatory cycle ➢ Masticatory reflex	➢ Need of mastication	Masticatory force and its measurement, neural control of mastication	1

Deglutition	➢ Review of steps in deglutition	neural control of deglutition and dysphagia		1
Calcium, phosphorous and fluoride metabolism	Source, requirements, absorption, distribution, function and excretion, clinical considerations		hypocalcemia and hypercalcemia, hyper-phosphatemia and hypophosphatemia and fluorosis	1
Theories of mineralisation	Definition, mechanism, theories and their drawbacks	Applied aspects of physiology of mineralisation	Pathological considerations – calculus formation	1
Physiology of taste	Innervation of taste buds and taste pathway,	Physiological basis of taste sensation, age changes	Applied aspects – taste disorders	1
Physiology of speech			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	1

PRACTICALS:

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

7. THEORY EXAMINATION (3Hours)

I. Write in details : 2x8 = 16 marks
II. Write Notes on:6 x5 = 30marks
III. Write short notes on : 8x3=24 marks

70marks

8. PRACTICAL / CLINICALEXAMINATIONS

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

Carving - 30Marks
Spotters and microscopic identification of slides - 50 Marks
Practical record book - 10 Marks

Total -90 Marks

Viva – 20 marks

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

9. FORMATIVE / INTERNAL ASSESSMENT

The internal assessment examination (both Theory/Practical) is held 3 times in a particular year. The marks scored by the students shall be displayed on the Notice board.

Note: An OSCE (i.e. **O**bjective, **S**tructured, **C**linical, **E**xamination) type of examination designed to test applied clinical skill performance and competence is being used for internal assesments. It is a hands-on, real-world approach to learning and assessment.

Theory - 10 Marks Practicals - 10 Marks Total - 20 Marks

10. 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.

11.TEXT BOOKS:

(i) Orban's oral histology and embryology – S.N. Bhaskar10thEd
(ii) Ten Cate's Oral histology _A Nanci 8th ed
(iii) Wheeler's dental anatomy, physiology and occlusion – Major.M.Ash
(iv) Textbook of dental anatomy, physiology and Occlusion- Rashmi GS

12.REFERENCE BOOKS:

(i) Sicher and DuBrul's OralAnatomy.
(ii) Oral Development & Histology - James &Avery
(iii) Dental Anatomy – its relevance to dentistry – Woelfel&Scheid
(iv) Applied Physiology of the mouth –Lavelle
(v) Physiology & Biochemistry of the mouth -Jenkin

5. 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 practice of dentistry without assistance and should be able to refer for medical conditions wherever needed.

2. **OBJECTIVES**

a. KNOWLEDGE AND UNDERSTANDING:

1. To identify pathological changes at macroscopic and microscopic levels and explain their observations in terms of disease processes.

2. To have the sufficient knowledge of the subjects learnt in first year and apply it to Pathology

3. To understand scope of morphological Pathology, Hematology and Clinical Pathology, and its limitations in the diagnosis of disease processes and conditions

4. Choose the relevant investigations needed for the diagnosis of the diseases.

b. SKILLS:

1. Identify the abnormal changes in the organs and tissues with special emphasis to oral cavity and relate it to basic concepts of pathological processes
2. Carry out certain investigations and ability to interpret lab findings of hematological and biochemical tests

c. ATTITUDE:

1. Willingness of the student to apply the knowledge gained in pathology in the best interest of the patient and the community.

2. Follow professional ethics in all their activities related to diagnosis and management of dental patients.
3. Willing to update knowledge in pathological conditions and diagnostic investigations from time to time.

d. INTEGRATION

The student must be able to correlate clinical findings and laboratory tests findings with basic concepts of general pathological processes and integrate the pathological aspects with the diseases so that it helps to understand the cause, mechanism of pathogenesis of disease and can arrive at a diagnosis and plan management of the disease.

4. TEACHING HOURS

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

3. TEACHING METHODOLOGY

a. Lectures
b. Demonstrations
c. Practical exercices
d. Audio visual aids
e. Small group discussions with regular feedback from the students
f. Integrated Teaching through Seminars, quizzes and Symposium
g. Digital museum: Digital images of Gross specimen and slides
h. Using social media such as whats app, Google class room for sharing U tube videos, assignments, quizzes. In addition students are encouraged and guided to use computer-based and web-based information technology enrich student learning

4. THEORY SYLLABUS : Annexure 1

5. PRACTICALS: **Annexure 2**

6. THEORY EXAMINATION (TITLE AND QP PATTERN WITH MARKS)

Part A - Pathology:

Essay type question 1 (2+3+3)= 8 Marks
Short notes 5 marks X 3 = 15 Marks
Short Answers 3 marksX4 = 12 Marks

Total = 35 Marks

7. PRACTICAL EXAMINATIONS- experiments, slides and OSPE

Lab experiments: Students should be able to perform these without assistance

- HB/TLC/Peripheral smear staining/ DLC - 10 Marks
- Urine analysis - 10 Marks
- OSPE - 5 Marks
- Spotters – (2 marksx10 spots) 20 Marks

Total 45 marks

Grand Viva - 10 marks

SPOTTERS: can include i. Histo pathology slides, ii. Haematology slides iii. Gross specimens, and iv. Instruments

Examination: Total 100

Theory	Internal Assessment 5 marks	Theory 35 marks	Viva 10 marks	Total 50 marks
Practical	Internal Assessment 5 marks	Exercises 45 marks	-	Total 50 marks

8. FORMATIVE/INTERNAL ASSESSMENT

The assessment examination (both Theory/Practical) held at 3times in an academic year.
The Internal Assessment marks of all three examinations are totalled and calculated out of 5 marks and submitted to the University at the end of academic session. The marks scored by the students shall be displayed on the Notice board

Formative assessment will also be conducted in the form of class tests and assignments after finishing every chapter or set of lectures on a topic. Extensive feedback is given on these tests to all the students.

9. **RECORD NOTE / LOG BOOK**:
Record shall be maintained by the students and assessed during practical class by faculty members.
Institution shall provide adequate number of microscopic slides, gross specimen and instruments, and other teaching materials as specified in Dental Council of India regulation for the students during practical training and examinations.

10. TEXT BOOKS

Students are advised to check for the latest edition.

i. Robbins BASIC PATHOLOGY – by Kumar, Abbas et al, 10th Edition, 2017 (Elsevier)
ii. Essential Pathology for dental students By Harsh Mohan , 5th Edition ,2016, Jaypee Brothers Medical Publishers
iii. Text book of Pathology for dental students By AK Mandal and Shramana Choudhury , First edition, 2012, Avichal Publishing Company
iv. Atlas and Text of Hematology by Tejinder Singh 3rd Edition, 2014, Avichal Publishing Company

Practical books

i) Practical pathology for dental students by Harsh Mohan
ii) Practical Pathology and Microbiology for Dental students by Tejinder Singh and CP Baveja

11. **REFERENCE BOOKS**:

- Robbins – Pathologic Basis of Diseases By Kumar and Kotran 10th Edition.
- Anderson's Pathology Vol 1 & 2 Editors – Ivan Damjanov & James Linder
- Wintrobe's clinical Haematolog Lee, Bithell, Foerster, Athens, Lukens

GENERAL PATHOLOGY THEORY SYLLABUS (ANNEXURE 1)

S. no.		**Must know**	**Desirable to know**	**Nice to know**
1.	Introduction to Pathology	Terminologies such as: Etiology and pathogenesis of disease , Morphology, Clinical features, signs and symptoms, Lab diagnosis, Complications, Outcome, Epidemiology, Clinicopathological Correlation,	Normal cell structure and functions Importance of Pathology for Dentistry Practice	Branches of Pathology, Role of Pathology lab Investigations in Diagnosis of disease, Types of pathological samples
2.	Cell Injury Reversible	Types of cell injury, Causes of cell injury (physical, Chemical, Biological, Genetic, immunological etc) Concept of reversible and irreversible injury Mechanisms of Hypoxic injury, Chemical injury, Free radical injury, Reperfusion injury Degenerations: fatty change, hydropic degeneration, Hyaline change , mucoid degeneration	Nature and demonstration of Fat in tissues by special stains	Non alcoholic fatty change and relation with metabolic disorders
3.	Cell Injury Irreversib	Cell death, Necrosis- Definition, Causes, Features and types of necrosis , Gangrene- types: dry, wet, gas Gangrene	Cellular ageing- mechanism and cellular changes,	Necroptosis, Pyroptosis, autolysis

	le	Apoptosis-Definition, Mechanism, physiological and Pathological examples Morphological changes in apoptosis, Difference in necrosis and apoptosis Differences between reversible and irreversible injury		
4.	Intracellular accumulation in Tissues	Pathological calcifications (metastatic and dystrophic), Common Pigment deposits (Carbon, hemosiderin, Melanin, lipofuscin)	special stains to demonstrate pigments, and calcification	
5.	Extracellular accumulation in Tissues	Amyloidosis- Classification, Primary and secondary amyloidosis, Mechanism, Pathogenesis, definition, Physical structure and chemical nature, Morphological changes in organs, special stains	Lab diagnosis of amyloidosis and clinical co-relation	Significance in dental surgery (Macroglossia)
6.	Inflammation I	Inflammation- definition, causes, types, Clinical- local and systemic symptoms and signs, Acute inflammation-vascular response and cellular response, Chemical mediators, Types of Inflammatory cells, fate of inflammation, Complication of acute inflammation, Differences between Acute and chronic inflammation Morphological types: such as serous, Fibrinous, Fibrinopurulent, Abscess, Ulcer, Hemorrhagic, Necrotizing	Morphological types of acute inflammation in Oral cavity	
7.	Inflammation II	Chronic inflammation-definition, non specific, specific, Granulomatous inflammation-causes, morphology ,Inflammatory cells in chronic	Types of Granuloma and types of Giant cells	

		inflammation, Difference in exudates and transudate, local, systemic effects and sequelae of chronic inflammation, consequences of excessive /defective inflammation		
8.	Healing of cell injury	Healing , regeneration, repair Differences in regeneration and healing. Mechanism and Component of healing Healing by primary and secondary intention Differences of Granuloma and granulation tissue Scar formation Factor influencing healing process, Causes of delayed healing	Types of parenchymal cells, stem cells and regeneration Hypertrophic scar and keloid Role of collagen in healing Wound contracture	Stem cells sites in oral cavity, Therapeutic Role of stem cells in Dentistry
9.	Specific infections	Tuberculosis - Epidemiology, - Pathogenesis (Formation of tubercle) - Pathological features of Primary and secondary TB, Complications and Fate Syphilis and Typhoid: - Epidemiology, - Types and stages of syphilis, - Pathological features, - Diagnostic criteria Oral lesions, -General principles of transmission and dissemination of microbes, Fungal and parasitic infections, Pathology of common viral and bacterial infections(CMV, EBV, HPV, Viruses, gram negative bacterial infections), AIDS –Pathogenesis, Modes of transmission, Clinical picture, Immunity levels in HIV Infection	Actinomycosis and Rhinosporidiosis Type of inflammatory reaction to specific infections	Changes in haematological parameters in peripheral blood in relation to infections (Viral, Bacterial, fungal etc)
10.	Hemodynamic disorders	Disorder of circulation-Hyperaemia, Congestion, Haemorrhage, Haemostasis Thrombosis --definition, pathophysiology -formation, complications & fate, Types of	Antemortem and post mortem clot,	

		thrombosis (arterial, venous, heart), Difference in arterial and venous thrombus, Embolism – Definition, Types, Effects, Derangements of body fluids- Oedema – pathogenesis, Different types, Disorders of circulation – Shock- types, mechanisms, stages Non progressive, Progressive and irreversible shock (compensated and decompensated) Disseminated intravascular coagulopathy Ischaemia and Infarction (definition, types, etiology and organs involved)		
11.	Hematology I	- Anemias – definition, classification Iron deficiency anemia and megaloblastic anemia, Hemolytic anemia - epidemiology aetiology, stages, clinical features , lab diagnosis and blood picture - Leukemia (acute and chronic)- classification, aetiology, diagnosis, clinical features, lab diagnosis, blood picture, - leukamoid reaction,	Hemoglobin – structure, Function, Normal values Red cell indices, Reticulocyte LAP score Philadelphia chromosome	Development of hematopoietic cells in bone marrow, Iron metabolism
12.	Hematology II	Bleeding Disorders-, Coagulation cascade tests Coagulation disorders , Haemorrhagic disorders, platelet function & platelet disorders, Lab diagnosis of bleeding disorder Idiopathic Thrombocytopenic purpura, Thrombocytopenic purpura, Hemophilia A and B, Von Willbrand Diseases, Disseminated intravascular coagulation	Normal Coagulation pathways	Blood banking, blood Components
13.	Immunological mechanisms in	Humoral & cellular immunity, Types, components of innate and adaptive immunity, antibodies, major histocompatibilty complex, Primary and secondary immunodeficiency,	SLE, Rhuematoid arthritis, Sjogren's syndrome	

	disease	Graft rejection, mechanisms in Hypersensitivity & autoimmunity		
14.	Nutritional disorders	Protein energy malnutrition, Common vitamins deficiencies (Vitamin A, B complex, C, D and K),	Obesity and over nutrition	
15.	Neoplasia I	Adaptive disorders of growth - Atrophy & Hypertrophy, Hyperplasia, Metaplasia and Dysplasia, General Aspects of neoplasia, Definition, terminology, Tumour biology, Precancerous lesions, Tumour classification, Clinical features Differences between benign and malignant Nomenclature, Tumor epidemiology, Host defence, Tumor antigen, Tumor immunity	Precancerous lesions of oral cavity	Cancer screening for early detection
16.	Neplasia II	Aetiology and pathogenesis of neoplasia, Carcinogenesis , Oncogenes Carcinogenesis (Chemical, Viral, radiation) Spread of Neoplasia, Diagnosis, prognosis, staging, Lab diagnosis of neoplasia	specific tumors-, Squamous Papilloma & carcinoma, Basal cell carcinoma, Adenoma & Adenocarcinoma, Fibroma & Fibrosarcoma, Lipoma & Liposarcoma	
17.	LIver	Liver function tests, Overview of Liver diseases, hepatitis, Jaundice Acute and Chronic hepatitis- pathogenesis, morphology and complication. Lab diagnosis of hepatitis	Normal Bilirubin metabolism, Australia antigen	
18.	Diabetes Mellitus	Diabetes Mellitus - Definition, Classification, Pathogenesis, Pathology in different organs, complications and Lab diagnosis	Normal Glucose metabolism Insulin function and regulation	Insulin Resistance

			Role of HBA1C	
19.	oral cavity, salivary glands	Diseases of oral cavity, Prenoplastic lesions (Dysplasia, Leukoplakia, Erythroplakia, Oral submucosal fibrosis) Neoplastic dis- Oral cancer, Tobacco harms , Screening, Early detection and Diagnosis, Lichen planus, Stomatitis, Dental caries, Dentigerous cyst, Ameloblastoma. Diseases of salivary glands - Pleomorphic adenoma, adenocarcinoma	Classification of salivary gland tumours	
20.	Cardiovascular system	Diseases of Cardiovascular system: Atherosclerosis, Hypertension :- Definition, classification Pathophysiology, Effects in various organs, complications, Morphological changes Benign and malignant hypertension Ischaemic heart Disease- Angina, Myocardial infarction Cardiac failure- causes, morphology, signs and symptoms Congenital heart disease - ASD, VSD, PDA, Tetralogy of Fallot, Infective and Rheumatic endocarditis- Causes, predisposing factors, Morphological changes in heart, complications	Lab diagnosis of Infective and Rheumatic endocarditis Lab diagnosis of Myocardial infarction Lab diagnosis of Hypertension	Vasculitis, aneurysms, Stroke Diseases of myocardium, diseases of pericardium
21.	Bone and Joints	Bone fracture and healing, osteomyelitis Bone Tumours: Osteosarcoma, Osteoclastoma, Giant cell Tumour, Ewing's sarcoma, Fibrous dysplasia, Aneurysmal bone cyst	Metabolic diseases of bone, Classification of Jaw tumours and other bone tumours,	

			X ray pictures of common bone tumours	
22.	Kidney	-	Laboratory tests in renal diseases with special emphasis to Diabetic changes and hypertensive changes in Kidney.	
23.	Lymph node	Causes of Lymphadenopathy, Non neoplastic disorders of lymph node, Hodgkin's and Non-Hodgkin's lymphoma, Metastatic carcinoma in lymph node, Classification of lymphoma,	Role of lymphatic drainage in inflammation and neoplasia, anatomical groups of lymph nodes especially in head and neck	Diagnostic approach to the patient with lymphadenopathy

GENERAL PATHOLOGY PRACTICAL SYLLABUS ANNEXURE 2

S. no.	Topics	Practical exercises	New topics added
24.	Introduction to Pathology lab	• Instruments in the lab • Structure and Function of Light Microscope • Pathology museum	Lab safety • Bio waste management
25.	Introduction to Histopathology and Cytopathology	• Histopathology Sample collection and transport • Tissue processing, Staining routine and special	
26.	Histopathology slides	- Acute appendicitis, Granulation tissue, fatty liver	Coagulative, caseous & fat necrosis, Chronic cholecystitis, Chronic Gastric

		Chronic venous congestion lung & liver Kidney amyloidosis Tuberculosis, Actionomycosis, Rhinosporidiosis Papilloma, Basal cell Ca, Sq cell Ca Osteosarcoma, osteoclastoma, fibrosarcoma Malignant melanoma, Ameloblastoma, Adenoma Mixed parotid tumour, metastatic carcinoma in lymph node	ulcer, Foreign body granuloma, Amyloidosis tongue, Pigment deposition (carbon, hemosiderin), Medial calcification, Granulation tissue Edema lung Thrombus , Atheroma, Lipoma Adenocarcinoma, Hodgkin's lymphoma Leiomyoma, Ewing's sarcoma Benign nephrosclerosis
27.	Gross Morphology	None in DCI curriculum	• Museum specimen Preparation • How to describe gross pathology specimen Gross morphology by specimen, digital museum, models, charts- Acute appendicitis, Chronic cholecystitis, Intestinal polyp, Lipoma, Renal cell carcinoma, Wilm's tumor , Lymphadenopathy, Fibroadenoma, Chronic cholecystitis with Cholelithiasis, Gastric ulcer, Malignant ulcer, Infarct kidney, Barrett's esophagus, Atherosclerosis, Hepatocellular carcinoma, Metastasis in liver, Pulmonary embolism, Carcinoma stomach, Osteosarcoma, Osteoclastoma, Fatty liver, Pleomorphic adenoma, Infarct Kidney, Cardiac hypertrophy
28.	Case based learning/ Clinical vignettes Clinical Scenario based learning	Not in DCI curriculum	• Inflammation • Tuberculosis • Shock, Thromboembolism, Edema fluids • Neoplasia- Squamous cell carcinoma • Diabetes mellitus, Hepatitis,

			• Myocardial infarction, Rheumatic heart disease • Oral premalignant lesions- submucosal fibrosis, Leukoplakia, • Bone tumors, Osteomyelitis • Anemia-Iron deficiency anemia, Megaloblastic anemia
29.	Introduction to Hematology	Blood sample collection Role of anticoagulants Types of blood samples	Safety precautions while handling blood Pipetting types and methods
30.	Haematology experiments	Haemoglobin estimation, Total leukocyte count, Differential leukocyte count, Leishman staining of peripheral blood smear	
31.	Hematology demonstrations	Demonstration: Bleeding time, Clotting time, Erythrocyte sedimentation rate, Packed cell volume	
32.	Hematology microscopic slides	Not in DCI curriculum	Anemia: Microcytic hypochromic anemia, Macrocytic anemia, Hemolytic anemia, Leukemia: Acute lymphoblastic leukemia, Acute myeloid leukemia, Chronic myeloid leukemia, Chronic lymphocytic leukemia Reticulocyte, Megaloblast Neutrophilia, Lymphocytosis, Eosinophilia
33.	Urine examination	Urine analysis for Specific gravity, abnormal constituents: proteinuria, glycosuria, Ketonuria, Blood, bile salts, bile pigments, Pyuria, hematuria	

34.	Lab Instruments	Name, uses of the following List: RBC & WBC pipette, Westergren pipette, Wintrobe's tube, Sahli's Hemoglobinometer, Blood vials, Neubauer's chamber, cover slip,	Bone marrow biopsy & aspiration needle
35.	Spotting	From any of the above	

6. MICROBIOLOGY

1. GOAL

To introduce the students to the 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 , with special reference to 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 aseptic procedures in the dental clinic.

iv. Should be able to make right choice of antimicrobials based on antimicrobial susceptibility test report based on spectrum of infection and ensure appropriate use to avoid antibiotic resistance.

c. ATTITUDE:

i. Should have the good intent to serve humanity within and outside the healthcare unit .

ii Should adopt good laboratory practices as well as good clinical practices to avoid any harm to the patient and/ or environment .

iii. Should cultivate an interest in self directed learning and keep on updating knowledge by book reading , using library resources , using e-resources .

d. **KNOWLEDGE ABOUT INFECTION CONTROL MEASURES .**

The student should know about cleaning, disinfection and sterilisation methods, standard precautions, biological spill management and bio-medical waste management guidelines.

e. COMPUTER PROFICIENCY:

Basic knowledge of Computers, MS Office, Window 2000 .

Students should be able to utilize a combination of traditional classroom courses and online courses[through whats app class groups, google classroom] .

3. COMPETENCIES

Essential professional skills :

Diagnosis and preventive measures of infectious diseases , notifiable diseases .

Personal Attributes :

Desire for wellbeing of all, effective communication, ethical approach, teamwork, decision making and leadership qualities.

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 :

THEORY

a) Lectures: Didactic as well as using audio visual aids , through power points .

b) Flipped classroom interactive teaching , using what's app class groups

c) Pair Share discussions using notes , books and world wide web as resource.

PRACTICAL

a) Practical exercises

b) Small group (five -six students) discussions.

c) Group activity :Making charts / preparing power points on topics like Co ntribution of scientists in Microbiology , Morphology of bacteria ,Culture media, Sterilisation, Lab diagnosis of infectious diseases , Standard precautions , Biomedical waste management etc. using text books and world wide web as resource.

6. **THEORY SYLLABUS**

TOPIC	MUST KNOW	DESIRABLE TO KNOW	NICE TO KNOW
GENERAL MICROBIOLOGY			
Historical Introduction	1. Contributions of the following scientists in the field of Microbiology : • Antony Van Leeuwenhoek • Louis Pasteur • Joseph Lister • Robert Koch • Alexander Fleming • Edward Jenner 2. Koch's Postulates		Nobel Laureates in Medicine and Physiology

Morphology & Physiology of bacteria	1. General aspects of microscopy, stained preparations, bacterial shape and size. 2. Structure of a bacterial cell and function of each structure 3. Salient features of a bacterial growth curve. 4. Physiological requirements of bacteria for growth.		
Sterilization and Disinfection.	1. Definition of cleaning, disinfection and sterilisation. 2. Various agents of Sterilisation.	Testing of Disinfectants	
Culture media	1. Categories of media 2. Constituents of media 3. Examples of culture media with their uses.		
Culture Methods	1. Indications for culture in a clinical laboratory. 2. Culture methods in a clinical laboratory and their specific purpose.		Methods of isolating pure colonies.
Identification of bacteria	1. Morphology 2. Staining reactions 3. Cultural characteristics 4. Metabolism : O2 requirement , CO2 requirement , pigment		Gas liquid chromatography for anaerobes. Molecular methods, e.g PCR.

	formation 5. Production of haemolysis . 6. Fermentation and other biochemical properties : Sugar fermentation, Indole, H_2S production , Citrate utilisation , Urease , Catalase, Oxidase ,Composite media .		
Taxonomy	1. Linnaeus classification 2. The species concept in bacteria; Clone, Strain 3. Nomenclature		Intra-species typing : Biotypes ,Phage types ,Serotypes, Colicin types Type cultures in international reference laboratories.
Bacterial genetics	1. Watson - Crick structure of DNA . 2. Extra chromosomal genetic elements . 3. Genotypic & Phenotypic variations. 4. Mutation: Definition, types, survival advantage (streptomycin - resistant mutant of tubercle bacilli). 5. Gene Transfer mechanisms: Transformation, Transduction, Lysogenic conversion, Conjugation .		

	6. Genetic mechanisms of drug resistance in bacteria: Mutational & Transferable.		
Collection & Transport of specimen for microbiological examination.	1. Principles of collection Sites , commensals and pathogenic organisms depending on the type of specimen , precautions to be taken , labelling of containers , 2. Specific procedures for collection of specimen from :Skin, upper respiratory tract ,gastrointestinal tract , central nervous system , urinary tract , blood stream , sinuses , abscesses, lid margins , ear .		
Antibiotic susceptibility	1. Significance 2. Kirby Bauer's & Stoke's Disc Diffusion Test 3. Interpretation	**MIC, MBC**	Broth dilution
IMMUNOLOGY			
Infection-	1. Source of infection 2. Modes of transmission 3. Factors predisposing to microbial pathogenecity 4. Types of infectious disease.		
Immunity	1. Types of immunity 2. Herd Immunity		

	3. Vaccines		
Antigens	1. Definition 2. Characteristics of antigens.		Super antigens
Immunoglobulins	1. Definition 2. Classes of immunoglobulins. 3. Important features of each class of immunoglobulin.		
Antigen - Antibody reactions (Ag-Ab reactions)	1. Definition of serological reactions. 2. Types 3. General Features 4. Mechanism underlying each Ag-Ab reaction . 5. Examples of diagnostic tests utilising principles of various Ag-Ab reactions.		Coombs test , CFT
The Complement system	1. General properties and Biological effect of complement.	1. Two types of pathways 2. Application of complement system in diagnostic test for Ag-Ab reaction.	Deficiencies of complement system.
Structure and functions of immune system	1. Organisation of lymphoid system. **2.** Characteristics and maturation of T cell and B cell**.** 3. Constitution and importance of Human Major Histocompatibility Complex and HLA antigens.	Importance of phagocytic cells and null cells.	

Immune response	1. Types 2. Concept of humoral immune response, primary and secondary response, Ab production, and factors influencing it. 3. Concept of cell mediated immune response ,	Immunological tolerance to immune response with reference to autoimmune disease.	Theories of immune response.
Immunodeficiency disorders	1. Types : Primary and Secondary 2. Disorders relevant to dentistry.		SCID, MHC (Class I and II) deficiency, Ataxia-Telangiectasia, Wiskott-Aldrich Syndrome
Hypersensitivity	1. Definition 2. Classification 3. Mechanism underlying hypersensitivity reactions and examples of diseases e.g. TB Leprosy, Atopy, Contact Dermatitis		
Auto immunity, classification with special reference to autoimmune disorders involving oral cavity.	1. Definition and examples	Mechanisms underlying autoimmunity e.g. Sjogren's syndrome, Streptococcal M, SLE,	

		Myasthenia gravis, Rheumatoid arthritis, Graves disease, Pernicious anaemia, autoimmune orchitis	
Immunology of transplantation and malignancy	1. Classification of transplants	Graft v/s Host reaction	HLA Antigens:3 Classes
SYSTEMATIC BACTERIOLOGY			
Staphylococcus	1. Morphological & Physiological Characteristics of bacteria in the genus Staphylococcus 2. Diseases caused by Staphylococcus aureus, Lab diagnosis	Treatment, Drug resistance & Methicillin Resistant Staphylococcus aureus in nosocomial infections	Coagulase Negative Staphylococcus aureus Features by which staphylococcus aureus and staphylococcus epidermidis can be identified
Streptococcus spp.	1. Morphological & Physiological Characteristics of bacteria in the genus Streptococcus	Features of differentiation between	Group C, F, G, D

	2. Diseases caused by Group A Streptococcus & lab diagnosis 3. Nonsuppurative complications of streptococcal infections 4. Viridans group of Streptococci examples with causation of dental caries	various groups of streptococci Bacitracin, CAMP Test Neonatal Meningitis	
Streptococcus pneumoniae	1. Morphological & Physiological Characteristics of bacteria in the genus Streptococcus 2. Differentiation between Streptococcus pneumoniae & Streptococcus viridans	1. Diseases caused by Streptococcus pneumoniae with laboratory diagnosis 2. Quellung Reaction	
Neisseria spp.	1. Morphological & Physiological Characteristics of bacteria in the genus Neisseria spp. 2. Characteristic features of Neisseria meningitidis & Neisseria gonorrhoeae, disease caused and laboratory diagnosis		Non-Gonococcal Urethritis

Corynebacterium spp.	1. Morphological and physiological characteristics of Corynebacterium species 2. Features by which Corynebacterium diphtheriae can be identified and distinguished from other corynebacteria **3.** Spectrum of diseases caused by Corynebacterium diphtheria. Lab diagnosis of Diphtheria **4.** Pathogenicity **5.** Toxigenicity testing	Active Immunisation with diphtheria toxoid specially in the wake of recent year outbreaks in Kerala	1. Biotyping 2. Diphtheroids **3.** Other species of Corynebacteria
Bacillus spp.		Morphological and physiological characteristics of Bacillus species particularly Bacillus anthracis . Spectrum of diseases caused by Bacillus anthracis & Bacillus cereus	Role in food poisoning and bio terrorism
Clostridium	Tetanus and antibiotic induced diarrhoea	Gas Gangrene and botulinum food poisoning,	

Mycobacterium	1. M.tuberculosis 2. RNTCP Guidelines	Atypical Mycobacteria	M.leprae MDR& XDR TB ,
Non sporing anaerobes .	Classification , Pathogenesis, Features of anaerobic infection & Laboratory diagnosis		
Enterobacteriaceae	Escherichia coli, Klebsiell spp , Proteus spp. , Salmonella spp. , Shigella spp.	(with mention of ESBL's and their significance in the spread of drug resistance)	
Pseudomonas	Morphology, cultural characteristics, virulence factors, disease caused and importance in burn infections and Hospital Acquired Infections	Acinetobacter (role in ventilator associated pneumonia and colistin resistance)	
Vibrio cholera	Morphology and culture. Disease caused and classification. Epidemiology and serotypes. Clinical features and pathogenesis	Lab diagnosis of cholera	Bacteriophage typing
Spirochaetes	Salient aspects of pathogenesis, clinical presentation, diagnostic tests and treatment of infections caused by Treponema	Borrelia, Leptospira	

Miscellaneous bacteria	Mycoplasma, Actinomycetes	Riickettsiaceae, Chlamydiae, Helicobacter	Gardnerella, Legionella
Oral Microbiology	Normal flora of oral cavity Dental Plaque, Dental Caries, Acute Necrotizing Ulcerative Gingivitis	Endodontic infections & Dental abscess	
VIROLOGY			
VIROLOGY	1. General properties of Viruses, resistance, cultivation of viruses, host-virus interactions with special reference to interferon. 2. Laboratory diagnosis of viral infections. 3. Cultivation of viruses 4. Bacteriophage 5. Herpes virus 6. Measles , Mumps and Rubella 7. Hepatitis viruses with special reference to Hepatitis B and Hepatitis C virus 8. HIV 9. Influenza A & B	1. Pox viruses 2. Polio virus 3. Rabies virus	Emerging and Re-emerging viral infections: 1. SARS 2. Ebola 3. ZIKA **4.** NIPAH

MYCOLOGY	1. Introduction 2. Classification 3. Laboratory diagnosis 4. Candidiasis and associated oral lesions 5. Mycetoma 6. Cryptococcosis	1.Systemic mycoses 2.Subcutaneous mycoses	1.Opportunistic fungal Infections
PARASITOLOGY			
Protozoa	1. Introduction to parasitology 2. Different modes of transmission of parasites . 3. Prevention of parasitic infections. 4. Entamoeba histolytica, Entamoeba gingivalis 5. Giardia lamblia (with reference to infections in children) 6. Trichomonas species(T . vaginalis and T.tenax) 7. Plasmodium vivax 8. Plasmodium falciparum	Leishmania donovani	Toxoplasma spp**.** & prevention of TORCH infections in ante-natal care .
Nematodes	Common helminthic infections: Intestinal nematodes : 1. Ascaris lumbricoides, Ancylostoma duodenale, 2. Trichuris trichiura 3. Enterobius vermicularis, Strongyloides stercoralis (with		

	special reference to infection in HIV patients) Tissue nematode : 1. Trichinella spiralis 2. Wuchereria bancrofti		
Cestodes	Tape worms 1. Taenia saginata 2. Taenia solium (with special reference to neurocysticersosis) 3. Echinococcus granulosus .		Trematodes 1. Schistosoma haematobium
Applied microbiology	1. Standard precautions & Hepatitis B Vaccination for Health care providers . Needle stick injury and post exposure prophylaxis. 2. Biologicalspill management. 3. Bio medical waste management guidelines. 4. Vaccines 5. Anti microbial susceptibility testing 6. Pre-Test and Post-test Counselling and Confidentiality in HIV testing in ICTC (Integrated Counselling and Testing Centre)	Antibiotic Stewardship	• Air Water and milk bacteriology • Bioterrorism • Biosafety levels

7. PRACTICALS

Topics

1. Instructions for working in laboratory and Microscopy.
2. Glassware, equipments &Sterilisation methods.
3. Universal presence of microbes, Standard Work Precautions, Biomedical Waste management & Management of biological spill.
4. Observation of Microscopy Slides of Bacteria, Fungi and Parasites.
5. Observation of AST on Mueller Hinton Agar; Kirby Bauer's Method, Stoke's Method.
6. Observation of Various culture media with and without culture growth, Bio chemicals & Various culture methods.
7. Serological Reactions : Observation of VDRL tile , ELISA & Microtitre plate .
8. Demonstration of Hanging drop preparation & Simple staining with Methylene blue and Negative (India Ink) staining
9. Demonstration of Staining Techniques : Gram's Staining, Ziehl Neelsons Staining and Alberts Staining.
10. Hands on practical on Grams Staining, Hanging Drop preparation of Staphylococcus / Streptococcus, demonstration of Catalase test, Coagulase test. Observation of: Culture of Staphylococcus on BA, Culture of Streptococcus with α and β - haemolysis on BA, CAMP test and Bacitracin sensitivity.
11. C. diphtheriae & Neisseria spp. Demonstration of Albert Staining of C. diphtheria.Observation of Loeffler's Serum slope, Post nasal swab. Observation ofMicroscopy slide of Gram –negative diplococci, Chocolate agar and Oxidase test.

12. Anaerobes .Lab Diagnosis of Anaerobic Infections. Observation of Anaerobic Jar, RCM, Gas pak, Microscopy Slide of Cl. tetani

13. Mycobacterium tuberculosis: Lab diagnosis of Tuberculosis. Observation of ZN stained Slide of AFB, LJ medium without growth, Tuberculin syringe. Hands on ZN staining

14. Observation of Culture of E.coli , Klebsiella spp. on MacConkey's agar , Proteus spp. on BA .Biochemicals Indole, Urea, Citrate, TSI . Blood culture bottle. Culture Exercise of Preparation of Hanging Drop from the culture broth of E.coli, Klebsiella spp. , Proteus spp. preparation of gram stain from their cultures on Mackonkey's agar and Blood Agar, observation of their growth of on ackonkey's agar and Blood Agar / NA and Final Interpretation.

15. V.cholerae & Pseudomonas :Observation of Alkaline Peptone Water & Mac Conkey's Agar. Observation of smear of GNB , Culture of Pseudomonas on Nutrient Agar , Oxidase test. Culture Exercise : Preparation of Hanging Drop from the culture broth of Pseudomonas spp. , preparation of gram stain from the culture of Pseudomonas spp , observation of culture growth of Pseudomonas spp on NA and Final Interpretation.

16. Spirochaetes : Lab Diagnosis of Syphilis. Observation of VDRL tile /RPR tile and microscopy slide of , Fontana staining.

17. Observation of microscopy slides of Nocardia & Actinomycetes .

18. Faeces Examination : Concentration techniques. Demonstration of saline & iodine preparation for ova & cysts. Demonstration of faeces examination for cysts of Entamoeba histolytica & Giardia lamblia.

19. Plasmodium spp : Observation of microscopy slides of malarial parasite , Plasmodium vivax & Pl. falciparum showing ring forms, schizonts & gametocytes.

20. Intestinal Nematodes: Demonstration of ova of Ascaris lumbricoides in faeces..

21. Tissue Nematodes: Observation of peripheral blood smear for microfilaria of Wuchereria bancrofti .

22. Viral Cultivation Techniques . Observation of diagram of parts of fertilized egg and egg inoculation , tissue culture bottle & microtitre plate -its uses in virology.

23. Mycology : Observation of Gram Stained smear and India Ink preparation of Candida spp. , Cryptococcus spp. and culture of Candida spp.

8. THEORY EXAMINATION

Microbiology:

1.LAQ	1 X 8	= 8 Marks
2.SAQ	3 X 5	= 15 Marks
3.SAQ	4 X 3	= 12 Marks
	Total	= 35 Marks

Note:

1. LAQ from General microbiology , Systematic Bacteriology , Virology.
2. SAQ from General Microbiology, Immunology , Parasitology , Oral Microbiology.
3. SAQ from General Microbiology, Immunology , Parasitology , Virology , Applied microbiology.

9. PRACTICAL EXAMINATION

Contents	Marks	Time duration
1. **Spotters** (10x 2marks each)	20 marks	30mts
2. **Culture Exercise** :	15 marks	15 mts

Includes gram staining , culture observation and final interpretation .

3. **Two Clinical vignettes based on special stains :**

2x5 marks = 10 marks 05 mts.

- **Theory Viva :** 10 marks

To be conducted alternately with General Pathology , in the forenoon .

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

10. FORMATIVE /INTERNAL ASSESSMENT

The formative assessment (both Theory/Practical) shall be held three times in an academic session. Each formative assessment marks shall be shall be displayed on the departmental Notice board with feedback , within 15 days of the examination . An average of three formative assessment marks shall be considered as final internal assessment. The Final Internal Assessment marks shall be submitted to the university, once before the summative examination and it shall be included in the summative examination.

Theory: 5 marks

Practicals: 5 marks

Total : 10 marks (Gen. Pathology + Microbiology)

11. PRACTICAL MANUAL

Practical manual shall be completed by the students topic wise and assessed periodically by faculty and HOD.

12. TEXT BOOKS

i. Text book of Microbiology by R.Ananthanarayan & C.K. Jayaram Paniker.

ii Medical Microbiology by David Greenwood et al.

iii. Textbook of Parasitology by K.D.Chatterjee.

iv. Paniker's Text book of Medical Parasitology.

13.BOOKS FOR FURTHER READING/REFERENCE.

i. Microbiology by Prescott, etal.

ii. Microbiology by Bernard D. Davis , etal.

iii. Clinical & Pathogenic Microbiologyby Barbara J Howard, etal.

iv. Mechanisms of Microbial diseases by Moselio Schaechter, etal.

v. Immunology by Donald M Weir

vi. Immunology 3rd edition by Evan Roitt , etal.

vii. Oral microbiology and infectious diseases by Burnett and Scherp

viii. Jawetz' text book of microbiology

7. General and Dental Pharmacology and Therapeutics

GOAL :To inculcate rational prescribing with scientific basis of therapeutics for future Dentists.

OBJECTIVES

a) KNOWLEDGE AND UNDERSTANDING: At the end of the course the student shall be able to

1. Understand and apply pharmacokinetics and pharmacodynamics of essential and commonly used drugs in general as well as for dental conditions.
2. List the indications, contraindications, interactions and adverse reactions of commonly used drugs with rationale.
3. Know the Essential Medical List and its importance and applicability.
4. Applied aspects of clinical pharmacology.
5. Prescribe special care in conditions such as pregnancy, lactation, immunocompromised conditions, pathological conditions related to liver and kidney.

b) SKILLS:

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

1. Prescribe drugs for common medical and dental ailments.
2. Appreciate adverse reactions and drug interactions of commonly used drugs
3. Observe experiments designed for study of effects of drugs.
4. Critically evaluate drug formulations and be able to interpret the clinical pharmacology of marketed preparations
5. commonly used in dentistry.
6. Laws governing clinical trials and for promoting drug advertisements.
7. Pharmacovigilance and reporting of Adverse drug reactions and its relevance.

c) ATTITUDE:

To develop the attitude to serve the community as dentist as well as general practitioner in rural areas subject to unavailability of primary care physician.

d) INTEGRATION:

Practical knowledge of use of drugs through integrated teaching and parallel posting in clinical departments.

e) KNOWLEDGE ABOUT INFECTION AND CROSS INFECTION IN DENTISTRY

1. Knowledge about asepsis – disinfection and sterilization of instruments, clinical area / personal care as per Standard operating procedures and guidelines.
2. Students should be aware of the rules and regulations regarding maintenance of clinical set up and waste disposal.

f) COMPUTER SKILLS:

Basic knowledge of Computers, MS Office, Windows, Practical simulations, Statistical Programmes.Basic operative skills in analysis of data and knowledge of multimedia.

g) COMPETENCIES

1. General skills
2. Practice Management
3. Communication and Community Resources
4. Patient Care – Diagnosis
5. Patient Care - Treatment Planning
6. Awareness about adverse drug reaction reporting.

h) TEACHING HOURS

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

i) 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, simulations
e) Small group discussions on pharmacotherapeutics rationale, with regular feed back from the students
f) Integrated and interactive Teaching

g) Symposium, students quiz and continuing medical education programmes.

j) THEORY SYLLABUS

□□New drug development- clinical trials, biomedical ethics in brief
□□Pharmacovigilance & Pharmacoeconomics

SYSTEMIC PHARMACOLOGY

Topic Must Know /Desirable To Know/ Nice To Know

1. General Pharmacology- Must Know
2. National Pharmacovigilance Programme and adverse drug reaction reporting protocol - Must Know

Drugs related to and their implications in dentistry:

3. Cardiovascular System - Desirable To Know
4. Vitamins: Water Soluble, fat soluble vitamins - Must Know
5. Antibiotics- Must Know
6. Drugs Acting On Central Nervous System- Desirable To Know
7. Vaccines- Nice to Know
8. NSAIDs- Must Know
9. Diuretics- Nice To Know
10. Drugs Acting On GI Tract Desirable To Know
11. Drugs Acting On Blood- Must Know
12. Local Anesthetics - Must Know
13. General Anesthetics- Desirable To Know
14. Drugs Acting On Autonomic Nervous System- Must Know
15. Anti-neoplastic Agents- Desirable To Know
16. Insulin And Oral hypoglycaemic Drugs- Desirable To Know
17. Corticosteroids excluding sex steroids
18. Antiseptics And Disinfectants - Must Know
19. Dental Pharmacology (Antiseptics in dentistry, obtundents, mummifying agents, bleaching agents, styptics, disclosing agents, dentifrices, mouth washes, caries and fluorides & treatment of common oral conditions in dentistry.) - Must Know
20. Bioethics related to research and clinical trials - Nice To Know

PRACTICALS

1. Procedures and demonstrations:

2. To familiarize the student with prescription writing and dispensing.
3. Rationale of drug combinations of marketed drugs
4. Pharmacotherapeutics
5. Drug induced Clinical Conditions
6. Equipments in Pharmacology & Pharmacy

(Introduction to Pharmacy & instruments, Sources and Nature of drugs, Drug Schedules, Drug Dosage forms, Prescription writing, Clinical problems & Rational prescribing, Drug dose calculation, Drug advertisements & Pharmacy preparations.)

k) THEORY EXAMINATION- Total = 100 marks

- **Part-A (35 marks):** Long question=8 marks, Short notes=15 marks, Rationale/Explain why-12 marks
- **Part-B (35 marks):** Long question=8 marks, Short notes=15 marks, Rationale/Explain why-12 marks
- **Theory viva-voice**=20 Marks
- **Theory Internal Assessment**=10 marks

l) PRACTICAL EXAMINATION- Total = 100 marks

- Dispensing pharmacy Preparation= 30 marks
- Prescriptions (Dental-1, Medical-1): 2x8=16 marks
- Drug Dose Calculation exercise (Minimum-2)=2x5= 10 Marks
- **OSPE:** Drug induced Clinical Condition/ Identify of equipment/glassware: Spot (1)= 4 Marks
- Analysis of Drug Advertisement as per standard checklist (1)=10 marks
- **Practical viva-voice**=20 Marks
- **Practical Internal Assessment**=10 marks

Students are required to achieve at least 50% marks in theory and practical separately to get through the subject successfully.

m) FORMATIVE / INTERNAL ASSESSMENT

The continuing assessment examination (both Theory/Practical) held at least 3 times including sent up examination.

The Internal Assessment marks to be submitted to the university, once after sent up examination including 3 annual assessments.

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 before annual university examination whenever asked by authorities.
Theory Internal Assessment: 10 marks
Practical Internal Assessment: 10 marks
Total Internal Assessment= 20 marks

n) 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.
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o) BOOKS (Theory & Practical)

1. S.K.Srivastava- Pharmacology for Dental Students
2. K.D. Tripathi – Essentials of medical pharmacology
3. Tejinder S, K Uma Chaturvedi, C.P Baveja, Deep Inder- Practical Pathology Microbiology and Pharmacology (Dental Students)

p) REFERENCE BOOKS

1. Bertam G Katzung- Basic and clinical pharmacology
2. Goodman and Gilman- The Pharmacological basis of Therapeutics.
3. Lauerence D.R. Clinical Pharmacology

8. DENTAL MATERIALS

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. 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. 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

4. TEACHING METHODOLOGY

The objective of teaching can be achieved by various teaching tech such as

a. Lecture
b. Demonstration
c. Practical exercises
d. Audio Video aids
e. Group discussion
f. Integrated teaching

Titles of subjects of study

First Year: Dental Materials.
Second Year: Dental Materials.

5. THEORY SYLLABUS

TOPICS	MUST KNOW	DESIRA LE 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 Important Physical properties applicable to dental material s	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., Hue, value, chrome. and translucency physical properties based on laws of optics, dealing with phenomena of light, vision and sight. Thermal 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. Classification of materials from perspective of	Micro leakage, Thermal	

Biological considerations in use of dental materials. Gypsum & gypsum products	biological compatibility 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 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 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.	changes, Galvanism, toxic effect of materials Visible light cure polyether urethane dimethacrylate, Historical background ,	Biological evaluation for systemic toxicity, skin irritation, mutagenicity and carcinogenicity. Disinfection of dental materials for infection control. Any recent advancements in material and mixing devices

Impression materials used in dentistry	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 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.	development Of each impression material,	

Synthetic resins used in dentistry.	Classification of resins, Dental resins. 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	Historical background and, development of material. Miscellaneous resins & techniques: Repair resins, Relining and rebasing. Infection control in detail, Biological	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.

	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: 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.	properties and allergic 'reactions. Measurement of bond strength and micro leakage Amalgam Bonding Pit and fissure sealants. Restorative Resins Depth of cure Degree of conversion, Dual Cure resins	Extended application for composites: Resins for restoring eroded teeth, Pit and fissure sealing, Resin inlay system Indirect & direct, Core build up, Orthodontic applications. **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. **Dental Amalgam** Composition, Manufacturing of alloy powder, Amalgamation, Dimensional Stability, Strength, Creep, Clinical performance, Proportioning, Trituration, Condensation, Carving and finishing, Dimensional Change, Mercury hygiene Properties of pure gold Classification and forms of DFG Removal of surface impurities 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	Historical background, desirable properties of casting alloys Factors affecting success of amalgam Side effects of mercury Repair of amalgam restoration History, Compaction Direct gold restoration Historical background, desirable properties of casting alloys.	An alternative to metal casting process. Cad-cam process for metal & ceramic inlays 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. Another method of making copings - by copy milling (without casting Procedures
Direct filling gold			
Dental casting alloys			

	shrinkage. Biocompatibility – Handling hazards. & precautions of base metal alloys, casting investments used. Heat treatment :Softening & hardening heat treatment		

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, Ideal requirements: Properties of inlay wax: Flow, thermal properties Wax distortion & its causes.		Manipulation of inlay wax: Instruments & equipment required. Impression wax for corrective impressions, Bite registration wax.
Dental casting investments .	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.

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		Titanium alloys, application, composition, properties, welding, Corrosion resistance
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	Historical background . Methods of strengthening . Metal Ceramics (PFM). Metal Ceramic Bond. Metal Ceramic Bond - Nature of bond. Bonding using electro	Modifications and recent advances, Principles of cementation. Special emphasis on cavity liners and cement bases and luting agents.

Dental ceramics	releasing cements Luting cements, Agents for pulp protection Zinc Phosphate cement, Zinc Polycarboxylate Cement, Glass ionomer cement, 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.	deposition, foil copings, bonded platinum foil, swaged gold alloy foil coping. Technical considerations of porcelain and porcelain fused metal restorations. Technical consideration - Material and procedure used for abrasion and polishing,	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			
Mechanics of cutting			

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

6. 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.

7. THEORY EXAMINATIONS:

(3 Hours) (Two parts each of 35 marks)

Elaborate on	2 X 8	= 16 marks
Write Notes	6 X 5	= 30 marks
Short Notes	8 X 3	= 24 marks
Total		70 marks

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

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

8. PRACTICAL / CLINICAL EXAMINATIONS:-

I. i. Spotters: Identify and write the composition and two important uses:
ii. Spotters – 10 Nos. 10 X 3 = 30 marks Time – 2 Minutes each

II. Exercise No.1
Any one exercise of the following 20 Marks
i. Manipulation of Dental plaster and/or dental 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 20 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

Practical Viva-voce 20 Marks

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

9. FORMATIVE / INTERNAL ASSESSMENT:

The continuing assessment examination (both Theory/Practical) held at least 3 times in a particular year. The marks scored by the students will be displayed on the Notice board and a copy forwarded by HOD will be sent to the authorities.

10. RECORD NOTE / LOG BOOK:

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

11. TEXT BOOKS/ REFERENCE BOOKS

Name of the Book & Title	Author	Edn	Yr. of Publ.	Publ.'s Name Place of Publ.
Science of Dental Materials	Kenneth 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. O. Brien	06th	1996	Mosby, USA
Restorative Dental	Craig.	11th	2002	Mosby, USA
Materials used in Dentistry	S. Mahalaxmi	2nd	2018	Wolter Kluwer (India) Pvt.Ltd.

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. Dental plaster
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.

9. PRE CLINICAL CONSERVATIVE DENTISTRY

OBJECTIVES:

A. Knowledge and understanding

B. Skills and

C. Attitudes

A). Knowledge and understanding:

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

i. To diagnose and treat simple restorative work for teeth.

ii. To gain knowledge about aesthetic restorative material and to translate the same to patients needs.

iii. To gain the knowledge about endodontic treatment on the basis of scientific foundation.

iv. To carry out simple endodontic treatment.

v. To carry out simple luxation of tooth and its treatment and to provide emergency endodontic treatment.

SKILLS:

He should attain following skills necessary

i) To use medium and high speed hand piece to carry out restorative work

ii) Poses the skills to use and familiars endodontic instruments and materials needed for carrying out simple endodontic treatment

iii) To achieve the skills to translate patients esthetic needs along with function.

ATTITUDES:

i). Maintain a high standard of professional ethics and conduct and apply these in all aspects of professional life.

ii). Willingness to participate in CDE programmes to update the knowledge and professional skill from time to time.

iii). To help and participate in the implementation of the national oral health policy.

iv). He should be able to motivate the patient for proper dental treatment at the same time proper maintenance of oral hygiene should be emphasized which will help to maintain the restorative work and prevent future damage.

COMPETENCIES

- 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.

4. TEACHING HOURS

Subject	Lecture Hours	Practical Hours	Clinical Hours	Total Hours
Pre Clinical Conservative Dentistry BDS IInd year	25	200		225

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

MARKS DISTRIBUTION:

Practical and Viva Voce Only in University Examination

Internal Assessment - 20

Practical - 60

Viva Voce - 20

Total 100

Must Know	Desirable To Know
• Identification and study of hand cutting instruments chisels, gingival margin trimmers, excavators and hatchet. • Identification and use of rotary cutting instruments in contra angle hand pieces burs. • Preparation class I and extended class I and class II and MOD's and class V amounting to 10 exercises in plaster models. • Exercises in mounted extracted teeth of following class I, 4 in number class I extended cavities 2, class II 4 in number and Class V 2 in number. Cavity preparation base application matrix and wedge placement restoration with amalgam.	

• Exercises on phantom head models which includes cavity preparation base and varnish application matrix and wedge placement followed by amalgam restoration. • Class I - 5 • Class I with extension - 2 • Class II - 10 • Class II Mod - 2 • Class V and III for glass ionmers - 4 • Class V for amalgam - 2 • Polishing of above restorations. • Demonstration of Class III and Class V cavity preparation for composites, on extracted teeth completing the restoration. o Polishing and finishing of the restoration of composites. • Identification and manipulation of varnish and bases like Zinc Phosphate, Poly carboxylate, Glass Ionomers, Zinc Oxide, Eugenol cements. • Identification and manipulation of various matrices, tooth separators and materials like composites and modified glass ionomer cements. • Cast restorations • Preparation of Class II inlay cavity • Fabrication of wax pattern	

• Sprue for inner attachment • Investing of wax pattern • Finishing and cementing of class II inlay in extracted tooth. <u>Endodontics</u> • Identification of basic endodontic instruments • Coronal access cavity preparation on extracted upper central incisiors • Determination of working length. • Biomechanical preparation of root canal space of central incisor • Obturation of root canal spaces • Closure of access cavity	

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 3months.

Internal assessment: 10

5. RECORDBOOK

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.

6. TEXTBOOKS

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, Wolters Kluwer
5. Textbook of Operative Dentistry. Sikri Vimal K, CBS Publishers & Distributors Private Limited

REFERENCEBOOKS

1) Introduction to Dental Materials, VanNoort,

2) Applied Dental Materials, McCabe,

3) Ingle's textbook ofendodontics

4) Cohen's Pathways of Pulp

10. PRE CLINICAL PROSTHODONTICS

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, treatment planning, rehabilitation and maintenance of oral function, comfort, aesthetic and health of individual with loss of missing teeth/ oral structure using biocompatible substitutes.

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.

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 1st Year BDS - 100 Practical hours

During 2nd 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

.

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 - 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 - 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 (both Theory/Practical) held at least 3 times in a particular year. The marks scored by the students will be displayed on the Notice board and a copy forwarded by HOD will be sent to the authorities.

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

11. GENERAL MEDICINE

Goal: The goal of teaching General Medicine to BDS students is to impart knowledge about the holistic approach in the treatment.

Objectives:
At the end student shall be able to

1. Describe physiology and pathology of different organs and organ systems.
2. Manage common disorders.
3. Identify common medical emergencies and their management.
4. Take history and do general and systemic examination.
5. Interpret reports of common laboratory investigations.
6. Effectively communicate with compassion and empathy.

TOPIC	MUST KNOW	DESIRABLE TO KNOW
Aims of Medicine	Purpose, Scope, Definitions, Epidemiology, Etiology, Pathogenesis, Pathology, Symtomatology, Treatment, Management, Prophylaxis, Prognosis	
Infections	Malaria, Dengue, Influenza, Enteric Fever, Measle, Mumps, Diphtheria, Rubella, Herpes Simplex and herpes Zoster, HIV	Chikungunya, Ebola, Zika, Nipah
Respiratory System	COPD, Bronchial Asthma, Pulmonary Tuberculosis, Pneumonia	Lung Abscess, Bronchiectasis, Pleural Effusion, Pneumothorax,

Cardiovascular System	Systemic Hypertension, Heart Failure, Coronary artery Disease, Acute Myocardial Infarction, Acute Rheumatic Fever, Valvular Heart Disease (MS, MR, AS, AR), Infective Endocarditis, Arrythmias	Pulmonary Hypertension, Cor pulmonale, Congenital heart Disease
Nephrology	Acute Kidney Injury, Chronic Kidney Disese, Nephrotic Syndrome, Nephritic Syndrome	Urinary Tract infection, Nephrolithiasis
Neurology	Facial pain, Facial Nerve Palsy, Epilepsy, Headache (Primary and Secondary), Acute Meningitis	Chronic Meningitis, Cerebrovascular Accidents
Endocrinology	Diabetes Mellitus and its Complications, Hyperthyroidism, Hypothyroidism, Acromegaly, Cushings Syndrome	Calcium Metabolism, Parathyroid Diseases, Thyroid storm, Myxedema Coma
Hematology	Anemia, Thrombocytopenia, Agranulocytosis, Bleeding Disorders, Leukemia, Lymphoma, Lymphadenopathy, Oral Manifestations of Hematological Diseases	Splenomegaly
Gastroenterology	Peptic Ulcer and its Complications, Dysphagia,	Malabsorption Syndrome, Diarrhea, Dysentry
Hepatology	Acute and Chronic Viral Hepatitis, Cirrhosis, Ascitis, Complications of Cirrhosis, Portal Hypertension	Autoimmune Hepatitis, Upper GI bleeding

Emergency Medicine	Shock, Syncope, Sepsis, Cardiac Arrest, CPR	Pulmonary Edema
Others	Vitamin Deficiencies,	Balanced diet, Protein energy malnutrition

Teaching Hours

Lecture 60 hours
Practical 150 hours

Theory Examination (3 hours)

2 Long Questions of 8 marks each
6 Short Questions of 5 marks each
8 short Questions of 3 marks each
Total= 70 marks

Practical Examination

1 Long Case of 50 marks
1 Short Case of 30 marks
Spotting 10 marks

Viva -- 20 marks

Internal Assessment

Theory 10 marks (Average of 3 internal examinations)
Practical 10 marks (Average of 3 internal examinations)

12. GENERAL SURGERY

	GENERAL SURGERY THEORY SYLLABUS 2019 - 20				
Sl No.	TOPIC	MUST KNOW	DESIRABLE TO KNOW		NICE TO KNOW
1	History of Surgery	Brief introduction			
2	General Principles of Surgery	• History taking and compilation, • Examination of a surgical patient, • investigation, diagnosis and consent of a surgical patient. • Pre operative preparation and post operative management.			
3	Wounds	• Definition and classification • Pathophysiology and stages of wound healing • Wound management and its complications • Ulcers, Sinuses and fistulae; Gangrene.			
4	Inflammations	• Classification • Pathophysiology, and clinical features, • Systemic inflammatory response syndrome.			

5	Infections	• Introduction, • Classification, presentation; • Local infections – abscess – erysipelas; • Systemic infections – tetanus – Tuberculosis; • Toxemia and Septicemia. • Transmissible viral infections: Hepatitis, HIV.			
6	Shock	• Definition, classification, and path physiology, • clinical presentation, assessment, and evaluation	Blood and blood products Blood groups and Blood Transfusion		
7	Tumours, Ulcers, Cysts, Sunus and Fistulae	• Principles of Oncology • Difference between benign and malignant tumors • Benign tumours of skin and subcutaneous tissue • Cysts of skin and subcutaneous tissue • Benign and malignant cutaneous conditions			
8	Diseases of Lymphatic System	• Tuberculosis, • Secondaries	Lymphoma, Lymphoedema		
9	Diseases of the Oral Cavity	• Infective • premalignant and malignant conditions	• Diseases of Larynx and Nasopharynx; Tracheostomy.		

10	Face	• Development of face • Cleft lip • Cleft palate			
11	Neck	• Anatomy of neck and cervical lymph nodes • Common causes of cervical Lymphadenopathy, • Brief description of different neck dissections			
12	Salivary Glands	• Introduction and classification, • Salivary gland neoplasms.			
13	Thyroid Gland	• Anatomy, Physiology • Benign and Malignant lesions			
14	Parathyroid glands	• Anatomy, Physiology (Calcium metabolism) • Benign and Malignant lesions			
15	Jaw Swellings	• Swellings and tumours of the jaw			
16	Nervous System	• Injury and recovery of the cranial nerves • Facial palsy • Trigeminal neuralgia.			
17	Fractures	• Classification and general principles of management • Maxillofacial fracture.			

18	ATLS	• Triage, Basic Life Support • Primary and Secondary assessment. • Trauma to Thorax, Abdomen • Head injury with Traumatic Brain injury and care of Cervical Spine			
19	Anaesthesia	• General Principles • Types of anesthesia – local, regional, and general anesthesia			
20	Principles of Operative surgery	• Asepsis, antisepsis, Sterilisation • Minor surgical procedures • Biopsy			

GENERAL SURGERY CLINICAL SYLLABUS

The students of III BDS are taught to take proper history taking and perform a physical examination with a surgical perspective including examination of lymph nodes, oral cavity, and thyroid, swellings in the neck, systemic examination of the chest, abdomen, and limbs. They are also taught the basics of sterilization and the ways to keep them safe while examining the patients. Basics of BLS and ATLS are taught to the students all throughout.

GENERAL SURGERY : GOAL OF THE PRESCRIBED SYLLABUS

The aim of general surgery classes for III BDS students in the faculty of Dentistry is to acquaint the student to take proper surgical history and clinical examination needed for proceeding with any of the surgical procedures more related to Dentistry. For this purpose special emphasis is given to the topics of head and neck region apart from other general surgical chapters. At the end of the training the student is able to employ his basic general surgical training in managing patients needing any of the invasive procedures in the treatment of both dental and maxillofacial ailments in elective and emergency situations including benign and malignant lesions.

TEACHING HOURS

Total Lecture hours: 60 hours
Total clinical hours: 150 hours

PLAN OF MARKINGS

Theory Examination: (3 Hrs) :

Elaborate on: 2x8 = 16 Marks
Write notes on:5x6 = 30 Marks
Write briefly :3x8 = 24 Marks
Total Marks = 70 Marks

Practical Examination :

Long case: one: 1x50 = 50 Marks
Short case: one: 1x30 = 30 Marks
OSCE : two stations: 2x5 marks =10 Marks
Total Marks: = 90 Marks

Viva Voce Examination:

Questions on Theory and Clinical subjects
Total Marks: =20 Marks

SUMMARY OF GENERAL SURGERY MARKINGS:

Paper	Main Examination	Internal Assessment	Viva	Total
Theory	70	10	20	100
Practical	90	10	NA	100

13. ORAL PATHOLOGY AND ORAL MICROBIOLOGY

1. GOAL

The dental graduates during training in the institutions should acquire adequate knowledge, necessary skills and positive 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

- 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 anddata.
- 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 physicaland Social well-being of thepatient.
- 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 ofdentistry.
- Adequate clinical experience required for general dentalpractice
- 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.
- 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.
- Help and participate in the implementation of the national oral health policy.

3. COMPETENCIES

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

4. TEACHINGHOURS

A)	Lecture hours	25 hours (2nd BDS)
		120 hours (3rd BDS)

	Total	**145hours**

B) Practical/clinical hours 50 hours (2nd BDS)

80 hours (3rd BDS)

Total **130hours**

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5. TEACHING METHODOLOGY

i. Class room lecture
ii. Slide demonstration
iii. Small group learning
iv. Problem based learning
v. Case based discussion
vi. Student seminars

6. THEORY SYLLABUS

Topic	**Must know**	**Desirable to know**	**Nice to know**	**Hours**
Introduction:	An overview 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.			2

Developmental disturbances of teeth, jaws and soft tissues of oral and paraoral region :	• 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. • 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	• Associated syndromes	Obturators and treatment basis of Cleft lip and palate.	10
Dental caries	Definition • Clinical features • Clinical types - Diagnosis - Caries microbiology Aetiopathogenesis- Theories of caries with emphasis on ecologic plaque hypothesis, specific and non-specific plaque hypothesis. •Histopathology •Complication/sequelaeof dental caries. Caries activity/susceptibility tests	Caries preventive measures. (including chemical measures) Immunology of dental caries	Caries vaccines GV Blacks Classification of Dental Caries based on treatment and restoration design.	6

Pulp and periapical pathology and osteomyelitis.	• Aetiopathogenesisand their interrelationship. Clinical features Types ofpulpitis Microbiology Radiology Histopathology Periapicaldiseases • Definition, classification, clinical features and diagnosis of osteomyelitis. • Sequelae of periapical abscess–summary of space infections, systemic complications and significance. • Spread of oral Infections (including Cellulitis and Ludwig's Angina)	Cracked tooth syndrome Aetiopathogenesis and microbiology of Osteomylitis	Clinical staging of Osteomylitis	8
Periodontal disease	•Aetiopathogeneis and interrelationship •Clinicalfeatures •Radiology •Microbiology •Histopathology •Gingivitis •Desquamative gingivitis •Gingival enlargements •Periodontitis		Basic immunological mechanisms of periodontal disease	6

Microbial infection of soft tissue	Including immunological aspects, oral manifestation Microbiology, defense mechanisms, 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-Barrvirus •HIV infection FUNGAL •Relevant superficialmycosis	Relevant deep mycosis Spread of oral infections		8
Cysts of oral and maxillofacial region	Cysts of odontogenic, non odontogenic origin, pseudocysts And soft tissue cysts or oral and paraoral structures: •Epidemiology •Classification •Histogenesis •Aetiopathogenesis •Definition •Clinicalfeatures •Radiology •Histopathology	Associated syndromes.	Genetic basis of relevant cysts.	7

	Laboratory features			
Oral Precancer	Epidemiology Aetiology Clinical and Histopathological features of oral epithelial dysplasia Potentially malignant disorders	Recent advances in diagnosis, management and prevention of oral precancer	Histochemistry and frozen sections in diagnosis of oral diseases.	6
Tumors of the oral cavity 1. Odontogenic tumors	•Epidemiology •Classification •Histogenesis •Aetiopathogenesis •Definition •Clinical features •Radiology •Histopathology •Laboratory features	Associated syndromes	Genetic basis of relevant neoplasms Tumor markers	7

2. Epithelial tumors	Detailed study of following features of relevant neoplasms •Epidemiology •Classification •Histogenesis •Aetiopathogenesis •Definition •Clinical features •Radiology •Histopathology •Laboratory features	Associated syndromes Basics and implementation of National Tobacco Control Programme.	Genetic basis of relevant neoplasms.	8
3. Mesenchymal tumors	Detailed study of following features of relevant neoplasms •Epidemiology •Classification •Histogenesis •Aetiopathogenesis •Definition •Clinical features •Radiology •Histopathology •Laboratory features	Associated syndromes	Genetic basis of relevant neoplasms	8

4. Salivary gland tumors	Detailed study of following features of relevant neoplasms •Epidemiology •Classification •Histogenesis •Aetiopathogenesis •Definition •Clinical features •Radiology •Histopathology •Laboratory features	Associated syndromes	Genetic basis of relevant neoplasms	7
5. Bone tumors	Detailed study of following features of relevant neoplasms •Epidemiology •Classification •Histogenesis •Aetiopathogenesis •Definition •Clinical features •Radiology •Histopathology •Laboratory features	Associated syndromes	Genetic basis of relevant neoplasms Metastatic tumors to and from oral cavity and their routes of metastasis.	8
Disease of bones and joints	All relevant diseases under the following heads 1. Fibro-osseous lesions 2. Hereditary bone disorders 3. Langerhan cell histiocytosis 4. Diseases of TMJ	Associated syndromes		8

Allergic and immunological diseases of oral cavity	Brief overview of relevant lesions such as : • Recurrent Apthous stomatitis • Behcet's syndrome	Brief overview of relevant lesions such as : • Sarcoidosis • Reiters syndrome • Midline lethal granuloma • Contact stomatitis	Mechanism of autoimmunity	4
Regressive alteration of teeth:	Clinical features, aetiology and applied aspects of Attrition, abrasion, erosion, Abfraction bruxism, hypercementosis, dentinal changes, pulp calcifications and resorption of teeth.			5
Healing of oral wounds and complications	Wound healing factors, complications Dry socket Biopsy	Exfoliative cytology Advanced biopsy procedures including brush biopsy		4

Physical and chemical injuries of the oral cavity	summary of physical and chemical injuries Radiation effects of oral cavity Occupational injuries to the oral cavity Pigmentation of oral and paraoral region and discolouration of teeth.		Basics of radiation therapy	4
Non neoplastic salivary gland diseases.	Relevant disorders and knowledge about their •Definition •Classification •Epidemiology •Pathogenesis •Clinicalfeatures •Histopathology			5
Systemic diseases involving oral cavity:	Brief review oral manifestations diagnosis significance of • common blood • nutritional • hormonal • metabolic diseases of oral cavity.			6

Mucocutaneous lesions.	Knowledge about the clinical features, histopathology, differential diagnosis and management of : • Relevant genodermatoses • Relevant vesiculobullous lesions	Basics of Autoimmunity	Immunohistochemistry of vesiculobullous lesions	8
Diseases of nerves: Facial neuralgias	•Trigeminal •Glossopharyngeal •VII nerveparalysis		•Causalgia •Psychogenic facial pain Burningmouth syndrome.	2
Diseases of maxillary sinus:		Traumatic injuries to sinus, sinusitis, cysts and tumors involving antrum.		1
Principles of Basic Forensic Odontology.	Introduction, definition, aims and scope. Skeletal and dental profiling Age estimation from teeth DNA methods. Bite marks, rugae pattern and lip prints.	Determination of sex and blood groups from buccal mucosa/saliva.	Dental importance of poisons and corrosives	7
Bioethics for Research	ICMR Guidelines for Biomedical Research	Historical background of research ethics		1

Jurisprudence		Legislative measures by Govt. of India for tobacco control		1

7. **PRACTICALS**:

a)Procedures– Histopathological slides of relevant diseases.

b)Demonstrations– Spotters/specimens/radiographs

c) Forensic exercises pertaining to Cheiloscopy, rugoscopy, age estimation, tooth metrics

d) Preparation and study of ground sections of carious teeth

8. THEORY EXAMINATION: (3Hours)

Write in details: 2x8 = 16 marks
Write Notes on: 6 x5 = 30marks
Write short notes on: 8x3 =24 marks

70marks

9. PRACTICAL/ CLINICALEXAMINATIONS

MCQ's - 30Marks
Spotters and microscopic identification of slides - 50 Marks
Practical record book - 10 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 internal assessment examination (both Theory/Practical) is held 3times in a particular year. The marks scored by the students shall be displayed on the Notice board.

Note: An **OSCE** (i.e. **O**bjective, **S**tructured, **C**linical, **E**xamination) type of examination designed to test applied clinical skill performance and competence is being used for internal assesments. It is a hands-on, real-world approach to learning and assessment.

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

Total	**20marks**

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. A Text Book ofOralPathology – Shafer, Hine &Levy.
ii. Oral&MaxillofacialPathology - Neville, Damm, Allen & Chi.
iii. OralPathology - Regezi&Sciubba.

13. REFERENCEBOOKS

i. Oral Pathology –Soames &Southam.
ii. Contemporary Oral and Maxillofacial pathology–Sapp, Eversole,Wysocki.
iii. Oral Pathologyintrophics - Prabhu, Wilson, Johnson &Daftary.
iv. MedicalEthics -Francis.

v.Oralpathology - Soames &Southam

14. CRI POSTING SCHEDULE AND ORIENTATION

Period of Postings:

Oral Pathology & Microbiology - 15 days

ORAL MEDICINE AND RADIOLOGY
ORAL MEDICINE AND RADIOLOGY

FACULTY OF DENTISTRY

JAMIA MILLIA ISLAMIA

BDS: III year and IV year

AIMS

(1) To train the students to diagnose the common disorders of oro-facial region by clinical examination and with the help of such investigations as may be required and medical management of oro-facial disorders with drugs and physical agents.

(2) To train the students about the importance, role, use and techniques of radiographs/digital radiograph and other imaging methods in diagnosis.

(3) To train the students about the basic principles of clinical and radiographic aspects of forensic odontology.

COURSE CONTENT

The syllabus in ORAL MEDICINE & RADIOLOGY is divided into two main parts:

(I) Diagnosis, Diagnostic methods and Oral Medicine
- (A) Diagnostic methods.
- (B) Diagnosis and differential diagnosis.

(C) Oral Medicine & Therapeutics.

(D) (D) Behavioural sciences and ethics.

(II) Oral Radiology.

The students should have knowledge regarding the following

- Able to identify precancerous and cancerous lesions of the oral cavity, treat them medicinally and refer to the concernedspeciality for their management.
- Should have an adequate knowledge about common laboratory investigations and interpretationof their results.
- Should have adequate knowledge about medical complications that can arise while treatingsystemically compromised patients and take prior precautions/ consent from the concernedmedical specialist.
- Have adequate knowledge about radiation health hazards, radiations 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, OPG andsialography.
- Be aware of the importance of intra- and extra-oral radiographs in forensic identification and ageestimation.
- Should be familiar with jurisprudence, ethics and understand the significance of dental recordswith respect to law.

THEORY HOURS: 90 hours

- BDS Third year -15 hours.
- BDS Final year -70 hours.

PART-I ORAL MEDICINE AND DIAGNOSTIC AIDS

TOPIC	MUST KNOW	DESIRABLE TO KNOW
DIAGNOSTIC METHODS Diagnosis, provisional diagnosis, differential diagnosis and final diagnosis with emphasises on the importance of history taking, clinical examination and investigations in eliciting the diagnosis.	1. Methodology for Clinical examination- a) Detailed case history and General physical examination by inspection and palpation. b) Evaluation of normal clinical anatomical landmarks. c) Thorough and detailed examination of oro-facial region. d) Saliva as a diagnostic aid. e) Detailed examination of lesions such as swellings, growth, ulcers, erosions, sinus, fistula, pigmented lesions, red and white lesions. f) Lymph node examination and elaborate discussion on causes of lymphadenopathy. **g)** Differential diagnosis of orofacial pathologies and lesions	Forensic odontology
	2. Investigations- (a) Chair side investigations including electric pulp testing.	

	(b) Interpretation of intraoral radiographs and OPG under supervision of faculty member. (c) Advanced imaging techniques. (d) Biopsy and exfoliative cytology. (e) Haematological, Microbiological and other investigations necessary for diagnosis and prognosis.	
DIAGNOSIS AND DIFFERENTIAL DIAGNOSIS	1. Potentially malignant disorders and oral cancer of oral cavity. 2. Odontogenic and non-odontogenic orofacial pain. 3. Diagnosis of oral pathologies in systemic diseases. Knowledge regarding the management of medical complications of systemically compromised patients. Fitness / clearance consent for dental procedures from the concerned specialist. 4. Diagnosis of pulpo-periapical pathologies. 5. Inflammatory and infectious lesions affecting the jaws.	1. Developmental abnormalities of hard and soft tissues. 2. Diseases of bone and osteodystrophies. 3. Metabolic diseases. 4. Endocrine diseases 5. Oro-facial granulomatous diseases. 6. Miscellaneous disorders a. Burkitts lymphoma

	6. Salivary gland disorders. 7. Temporomandibular joint disorders 8. Common cysts and tumors: (a) Pseudo cysts (mucocele and ranula), bony cysts (odontogenic and non-odontogenic) (b) Tumors- i) Soft tissue- Epithelial (papilloma, carcinoma, melanoma), connective tissue (Fibroma, lipoma, fibrosarcoma), vascular (haemangioma, lymphangioma), nerve tissue (neurofibroma, traumatic neuroma), salivary glands (pleomorphic adenoma, adenoid cystic carcinoma, warthin'stumor) ii) Hard tissue- non-odontogenic (osteoma, osteosarcoma, chondroma, chondrosarcoma, central giant cell granuloma, and central haemangioma) and odontogenic (enameloma, ameloblastoma, calcifying epithelial odontogenic tumor). 9. Gingival and Periodontal diseases.	b. Sturge weber syndrome c. CREST syndrome. d. Orofacial syndromes.

ORAL MEDICINE AND THERAPEUTICS	1. Infections of oral and paraoral structures: Bacterial: Streptococcal, tuberculosis, syphillis, vincents, leprosy, actinomycosis, diphtheria and tetanus Fungal: Candida albicans Virus: Herpes simplex, herpes zoster, ramsay hunt syndrome, measles, herpangina, mumps, AIDS and hepatitis-B Oral mucosal lesions: a. White lesions: Chemical burns, leukodema, leukoplakia, fordyce spots, stomatitis nicotinapalatinus, white sponge nevus, candidiasis, lichenplanus, discoid lupus erythematosis. b. Red lesions: Erythroplakia, stomatitis venenata and medicamentosa, erosive lesions and denture sore mouth. c. Vesiculo-bullous lesions: Herpes simplex, herpes zoster, herpangina, bullous lichen planus, pemphigus, cicatricial pemphigoid erythema multiforme.	1. Pain arising due to CNS disease 2. Pain due to intracranial and extracranial involvement of cranial nerves. 3. Neuralgic pain due to unknown cause. 4. Altered sensation: Cacogeusia, halitosis. 5. Forensic odontology including : 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 remnants

	d. Ulcers: Acute and chronic ulcers e. Pigmented lesions: Exogenous and endogenous. f. Potentially malignant disorders of the oral cavity. g. Refer to the concerned speciality for the management of cancerous lesions. 2. Cervico-facial lymphadenopathy 3. Oro-facial pain (a) Organic pain – Pain arising from the diseases of orofacial tissues. (b) Referred pain 4. Tongue in local and systemic disorders 5. Oral manifestations of systemic disease 6. Diseases of salivary glands. 7. Dermatological diseases with oral manifestations. 8. Foci of oral infection and their ill effects on general health. 9. Management of dental problems in medically compromised patients.	

	10. Oral cancer including radiotherapy. 11. Nerve and muscle diseases. **12.** Therapeutics – Drugs commonly used in oral medicine and emergency drugs.	
BEHAVIOURAL SCIENCES AND ETHICS	Knowledge regarding jurisprudence, ethics and the significance of dental records with respect to law.	

Part II ORAL RADIOLOGY

TOPIC	MUST KNOW	DESIRABLE TO KNOW
ORAL RDAIOLOGY	1. Subject scope and history of origin. 2. Radiation physics : a) Nature and types of radiation. b) Properties of X-rays. c) Production of x-rays including power supply. d) Factors controlling the x-ray beam. 3. Dosimetry and radiation measuring units. 4. Biologic effects of radiation including complications of radiotherapy.	1. Magnetic resonance imaging. 2. Nuclear medicine imaging.

	5. Radiation safety and protection including infection control. 6. Projection geometry. 7. X-ray film, intensifying screens and grids. Radiographic accessories. 8. Processing x-ray film including faulty radiographs. 9. Digital and Manual radiographic technique <u>Intra-oral-</u> a) Periapical technique(Bisecting angle and paralleling technique). b) Bitewing radiographs. c) Occlusal radiographs. <u>Extra – oral</u> a) OPG b) Skull projections. c) TMJ imaging. 10. Normal radiographic anatomy 11. Panoramic imaging including landmarks 12. Advanced imaging techniques- (a) Computed tomography.	

	(b) Cone beam computed tomography. (c) Ultrasonography. (d) Sialography. 13.Interpretation of radiographs in various abnormalities of teeth, bones and other orofacial tissues. 14. Implant radiology	

PRACTICALS/CLINICAL

The prescribed number of hours for Practical- As per regulation

1. Students are trained to arrive at proper diagnosis by following a scientific and systematic procedure of history taking and examination of orofacial region.
2. Training is also imparted in management of orofacial pathologies.Saliva diagnostic check as routine procedure.
3. Training is imparted on various radiographic procedures and interpretation of radiographs.
4. Each student shall maintain a record of work done (Third year and Final year).
   i) Recording of detailed case histories of interesting cases – 10.
   ii) Routine OPD Cases : 100.
   iii) Intra-oral radiographs interpretation in manual– 25.
   iv) Routine intraoral radiographs: 100.
   v) OPG interpretation: 2

THIRD YEAR

1. Students attend didactic theory lectures which are on ppt.
2. Assignment work in form of definitions, differential diagnosis of ulcerative lesions, pulpo-periapical pathologies, periapical radiolucencies, periapical radiopacities, multilocular radiolucencies and intraoral radiographic technique.
3. Student project in form of posters.
4. Routine OPD patients.
5. Recording at least two cases in the manual.
6. Intraoral radiographs and its interpretation.

FINAL YEAR

1. Students attend didactic theory lectures which are on ppt.
2. Student project in form of seminars(ppt).
3. Routine OPD patients.
4. Recording special cases in the manual.
5. Intraoral radiographs and OPG interpretation.
6. Chair-side procedures like exfoliative cytology, incisional/excisional biopsy, pulp testing.
7. Physiotherapy of patients with oro-facial pain

BOOKS RECOMMENDED

1. Burket's – Oral Medicine.
2. Kerr, Ash and Millard – Oral diagnosis.
3. Shafer's Oral pathology.
4. White and pharaoh – Oral radiology.
5. Wood and Goaz - Differential Diagnosis of Oral and Maxillofacial Lesions.
6. Langland and Langlais – diagnostic imaging of jaws.
7. Eric Whaites - Essentials of Dental Radiography and Radiology.

SCHEME OF TEACHING

Theory and Practical examination : Maximum of 200 marks.

- **THEORY** : 100 marks.
  - University written exam 70
  - Viva Voce 20
  - Internal assessment (Written) 10
- **PRACTICAL /CLINICAL:** 100 marks.
  - University Exam 90
  - Internal assessment (Practical) 10

15. PAEDIATRIC AND PREVENTIVE DENTISTRY

1. GOAL

The dental graduates during training in the Faculty of Dentistry should acquire adequate knowledge, necessary skills and reasonable attitudes which are required for carrying out all dental procedures 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 affects 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: Holistic approach

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& Treatment Planning
5. 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 the physically and mentally challenged/disabled children effectively and efficiently, tailored to the needs of individual requirement and conditions.

4. TEACHINGHOURS

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

5. TEACHING METHODOLOGY

- Academic teaching with supportive aids- Power Point presentations, Interactive sessions with students in the lectures and during Clinical postings
- Conduction and supervisions of Seminars of few selected topics
- Evaluation of Pre-clinical and Clinical skills during their practical hours, Case histories & Clinical cases presentations
- Workshops, lectures, and exposures to CDE program

6. THEORY SYLLABUS

TOPIC	MANDATORY TO KNOW	RECOMMENDED TO KNOW
1. Introduction to Pedodontics And Preventive Dentistry.	• Definition, Scope, Objectives and Importance • Significance of the Pediatric Dentistry as a separate specialty	• Special role of Pediatric Dentistry in managing special children

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	• Implications and correlation of the Dental age and chronological age
3. Development of Occlusion from Birth Through Adolescence	• Study of Variations and Abnormalities • Occlusal changes occurring with the age	• Able to detect Chronological and dental discrepancies
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	• Implications of difference in the types of dentitions on dental procedures

5. Dental Radiology Related to Pedodontics	• Dental radiology related to Pedodontics • Techniques and Radiological Protocols	• Behaviour modifications and patient management during radiography
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	• Suturing techniques • Emergency management in bleeding disorders. • Advanced Oral surgical considerations in young child

	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	• Dental Caries prevalence and incidence.
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	• Gingival Indices, OHI • Prevalence and incidence of gingival disorders in children
9. Child Psychology	• Definition	• Implications of Theories in routine dental practices and procedures

	• 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	• Desensitization
10. Behaviour Management	• Definitions • Types of behavior encountered in the dental clinic • Non-pharmacological and pharmacological methods of behavior management • Conscious Sedation • General Anesthesia • Premedications	• Able to induce conscious sedation • Advanced behavior management strategies • Dental Treatment under sedation
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. • Manipulation and Properties and compositions of various	• Complete Dental rehabilitation of grossly carious cases/ ECC& rampant caries management • Delivery of Stainless Steel, Polycarbonate and Resin Crowns

	dental materials	
12. Pediatric Endodontics	• Principles and diagnosis of Various pulp pathologies • 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	• Management of complicated Endodontic cases.
13. Traumatic Injuries in Children	• Classification and Importance • Sequelae and Reaction of Teeth to Trauma • Management of Traumatized Teeth	• Emergency management in traumatic injuries. • Suturing techniques
14. Preventive and Interceptive Orthodontics	• Definitions • Problems Encountered During Primary and Mixed Dentition Phases and their Management • Myofunctional Therapy • Serial Extractions • Space Management	• Model analysis • Fabrication of Removable and Fixed space maintainers. • Dental cross bite correction • Modifications of space maintainers and space management in children

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	• Psychological management and counselling • Fabrication of Removable and Fixed habit breaking appliances
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.	• Management of cases with physical disabilities without sedation • Management of cases with disabilities under sedation and general anesthesia
17. Congenital Abnormalities In Children	• Definition, Classification, Clinical Features and Management	
18. Dental Emergencies In Children and Their Management	• Dental Emergencies in Children and their Management	• IV management in emergency cases
19. Dental Materials Used in Pediatric Dentistry	• Dental Materials Used in Pediatric Dentistry	• Properties, manipulation of dental materials
20. Preventive Dentistry	• Definition • Principles and scope • Types of prevention • Different preventive measures used in pediatric dentistry including Pit	• Pit and fissure sealants and topical fluoride applications

	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	• Education & motivation of the patients using disclosing agents. • Educating patients about oral hygiene measures like tooth brushing, flossing etc.
24. Child Abuse and Neglect	• Diagnosis of Various types of Child abuse • Management of child abuse and neglect	• Reporting of a child abuse case
25. Setting up of Pedodontics Clinic	• Dental considerations for a clinic designing and set up • Significance of waiting and play area	

26. Dental 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	
27. Recent trends in Pediatric Dentistry	• Radical changes in modern pediatric dentistry including translational research, holistic research, developing innovative technologies in early detection of the disease, and contemporary traditional medicines in oral care	• Role of Genetics in diagnosis of dental anomalies • Resin infiltration techniques • SDF Breakthrough
28. Advances in the Treatment strategies in Pediatric Dentistry	• Pain management • Technologically driven drugs delivery systems. • Esthetic pediatric Dentistry (Zirconia crowns) • Rotary endodontics in Primary teeth • Applications of lasers in pediatric Dentistry • Pediatric dental implants in children	
29. Inter professional dental care in complicated dental diseases and syndromes	• Role of a pediatric dentist in the management of Cleft lip and cleft palate cases • Corrective surgical procedures for children with cleft lip and palate • Orthopaedic appliances for children	

30. Regenerative dentistry	• Tissue engineering and regenerative medicine • Regenerative Endodontics for primary teeth	

7. CLINICAL POSTING SCHEDULE AND ORIENTATION / PRACTICALS

i) FOR BDS III YEAR STUDENTS (Non- Exam Going)

Period of Postings- One month

- During their posting in Pedodontics the BDS III-year students shall be completing the preclinical exercises
- Preclinical exercises will involve
  - Wax Carvings -Permanent teeth-central incisors and First molars (maxillary and mandibular)
    Primary Teeth- First and second primary molars (maxillary and mandibular)
  - Prepare Casts (Upper and lower-6 each)
  - Wire Bending (Adams, C Clasps, Labial Bow, Z-Springs, finger springs, Cribs, Rakes.),
  - Class I and II Cavity Preparations on Extracted/ Typodont Teeth,
- They will assist in OPD (Diagnosis and treatment)

ii) FOR BDS FINAL YEAR STUDENTS

Period of Postings- One month

- They will assist in OPD (Diagnosis and treatment)
- During their posting in Pedodontics the BDS Final year students shall perform Restorations, extractions, oral prophylaxis, pulp protection procedures on the patients
- Record case history (10 patients)
- Fabrication of Removable Appliances (Oral Screen, anti-thumb sucking and anti-tongue thrusting appliances, Cross bite correction appliance, Catalan's appliance, Hawley's retainer)

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

- Restorations - Class I & II only: (GIC& Others) - 45
- Preventive measures e.g. Oral Prophylaxis- 20
- Fluoride applications - 10
- Extractions - 25
- Case History Recording & Treatment Planning –10
- Education & motivation of the patients using disclosing agents. Educating patients about oral hygiene measureslike tooth brushing, flossing etc.

8. RECORD LOGBOOK/ Manual

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. The candidate will be given credit for maintaining their records based on the pre-clinical and clinical exercises.

EXAMINATION PATTERN

9. THEORY EXAMINATION (3 Hours)

Elaborate Ques	-	2 x 8 =	16 Marks
Write notes on	-	6 x 5=	30 Marks
Short notes	-	8 x 3=	24 Marks
			70Marks

PRACTICAL EXAMINATION- (90marks)

- **Spotters -** 30 marks (10 spotters)
- **Management of Child Patient in The Dental Clinic (60Marks)**
  - Case history - 30 marks
  - Diagnosis - 10 marks
  - Treatment plan - 10 marks
  - Treatment - 10marks

10. MARKS DISTRIBUTION

	Examination	**Internal Assessment**	**Viva**	**Total**
Theory	70 (Part A & B)	10	20	100
Practical	90	10	-	100
Total				200

10. INTERNALASSESSMENT:

- To assess the Theoretical & Clinical knowledge of the student and to understand their ability to manage child patients efficiently three assessment examination (both Theory/Practical) will be held at fixed dates in a particular academic year and the mean of all the three assessments will be considered.
- The assessment examination will comprise of a written test, oral viva.
- The third assessment will be sent-up exam, that will be held as per the final exam pattern
- The Internal Assessment marks will be submitted to the university at the end of the academic year.

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

12. LIST OF INSTRUMENTS REQUIRED BY BDS IV YEAR STUDENTS

Students will bring their own personal instruments sets during the clinical posting .

Miscellaneous Instruments

- Enamel tray-1
- Kidney trays (metal)-2
- Glass slab and spatula-2
- Plastic Spatula-1
- Mulling cloth -1
- Mortar and pestle-1
- Air rotor-1
- Diamond burs-5 each
  - Round bur- 010,012
  - Cylindrical-010,012
  - Taper fissure- 010,012
  - Inverted cone-010,012
  - Micromotor handpiece
  - Steel burs
  - Round bur-012,014
  - Cylindrical
  - Inverted cone- 012,014
- Matrix band holder-(1 and 8)
- Matrix bands (Ivory & Universal)

List of filling / Restorative instruments (5 each)

- Mirror
- Tweezer
- Straight probe

- Explorer (Sickle shaped probe)
- Plastic instrument
- Parallelogram condenser
- Cylindrical condenser
- Ball burnisher
- Spoon excavator
- Diamond carver
- Hollenbeck carver

Hand -Scalers set (5)

Green pouches (autoclavable)-10

Patient's drapes and trolley drapes (Autoclavable)-2

13. TEXTBOOKS

1) Dentistry for the Child and Adolescence - McDonald.
2) Pediatric Dentistry -Damle S. G.
3) Behaviour Management – Wright
4) Clinical Pedodontics -Finn
5) Pediatric Dentistry -Mathewson
6) Kennedy's Pediatric Operative Dentistry - Kennedy &Curzon.
7) Textbook of Pedodontios – Shobha Tandon
8) Pediatric Dentistry (Infancy through Adolescences) -Pinkham.
9) Clinical Use of Fluorides - Stephen H.Wei.
10) Understanding of Dental Caries – NikiForuk.
11) Management of Traumatized anterior Teeth - Hargreaves.

14. REFERENCE BOOKS

1) Occlusal guidance in Paediatric Dentistry -- Stephen H.Wei.
2) Paediatric Oral & Maxillofacial Surgery -Kaban.
3) Paediatric Medical Emergencies - P. S.Whatt
4) An Atlas of Glass lonomer cements - G. J.Mount.
5) Textbook of Pediatric Dentistry – Braham Morris.
6) Primary Preventive Dentistry - Norman 0.Harris
7) Handbook of Clinical Pedodontics –Kenneth.D
8) Preventive Dentistry - Forrester.
9) The Metabolism and Toxicity of Fluoride Garry M.Whitford..
10) Traumatic Injuries –Andreason.
11) Pediatric Drug Therapy –Tomare
12) Contemporary Ortodontics -Profitt.
13) Preventive Dentistry - Depaola.
14) Metabolism &Toxicity. of Fluoride - Whitford. G.M.
15) Endodontic Practice - Grossman.
16) Principles of Endodontics - Munford.
17) Endodontics - Ingle.
18) Pathways of Pulp - Cohen

16. 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 specialty and allied specialties whether in teaching or practice;
- willing to share the knowledge and skills with any learner, junior or colleague;
- to develop the faculty for critical analysis and evaluation of various concepts and views and to adopt the most rationalapproach

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 andUnderstanding
- Skills
- Attitude
- Knowledge about infections and cross infections in Dental Practice – HIV and Hepatitscontrol
- Computer Proficiency

a. <u>KNOWLEDGE:</u>

(i) Dental material knowledge
(ii) Craniofacial anomalies
(iii) Sterilisation
(iv) Orthodontic diagnosis
(v) Craniofacial Growth & tissue response
(vi) Etiology of skeletal & dental malocclusions

(vii) Identify social, economic, environmental and emotional determinants in a given case and take them into account for plannedtreatment;
(viii) Recognise conditions that may be outside the area of speciality or competence and to refer them to theconcerned

(ix) Knowledge by self study and by attending courses, conferences and seminars pertaining to speciality;
(x) Undertake audit, use information technology and carry out research in both basic and clinical with the aimof publishing or presenting the work at various scientificgathering.

b. SKILLS:

I. Clinical history, patient examination and essential diagnostic records
II. Orthodontic study models & analysis
III. Orthodontic radiographs including lateral cephalogram & analysis
IV. Comprehensive diagnosis & treatment planning
V. Removable & myofunctional appliance fabrication

c. ATTITUDE:

HUMAN VALUES, ETHICAL PRACTICE AND COMMUNICATION ABILITIES.

I. Dental ethics
II. Academic integrity
III. Professional communication & referrals
IV. Team based approach to patient management & intra-department work.
V. Case to case evidence based discussions.
VI. Patient care irrespective of social status, caste, creed, or religion
VII. Informed consent

d. INTEGRATION:

- Understanding of orthodontic problems
- Delivering comprehensive treatment
- Interdisciplinary approach to treatment

- Knowledge of syndromes and craniofacial anomalies

e. KNOWLEDGE ABOUT INFECTION AND CROSS INFECTION IN ORTHODONTICS:

- Universal precautions
- Orthodontic waste management
- Sterilization of orthodontic equipments
- Impression disinfection
- Handling orthodontic sharps
- Biomedical waste disposal

f. COMPUTERPROFICIENCY

i. Technological Requirements for all Graduate Students
a. Basic knowledge of Computers, MS Office Window 2000 , Statistical Programmes
b. Basic operative skills in multimedia
c. Handling e classrooms, online courses & webinars
ii. A laptop or desktop computer that supports the followingrequirements
a. Operating systemrequirements
b. Internet browserrequirements
c. Reliable and consistent access to theinternet
d. Antivirus software which is current and consistentlyupdated
e. MicrosoftOffice
f. Adobe Reader (or equivalent to view PDFfiles)
g. Adobe photoshop or equivalent

3. COMPETENCIES

1. General skills
2. PracticeManagement
3. Patient Care –Clinical Diagnosis

4. Patient Care – Treatment Planning
5. Orthodontic patient referral
6. Handling orthodontic emergencies
7. Soft skills & Communication with patient
8. Handling & fabrication of Basic orthodontic appliance
9. Patient education & awareness
10. Intra-oral & extra-oral photographs- orthodontic proficiency
11. Patient management software proficiency

4. TEACHINGHOURS

	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. Demonstrations,
4. Peer interactions
5. E-classrooms
6. Google quiz for classroom assessment
7. Classroom feedback from students

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.

S. NO.	TOPIC	MUST KNOW	DESIRABLE TO KNOW	NICE TO KNOW
1.	Introduction & Scope of Orthodontics	-Definitions & divisions of orthodontics: -Preventive -interceptive -Corrective -Surgical orthodontics -Goals of orthodontics: -Jackson's triad	-History of orthodontics -psychosoatic paradigm	
2.	Development of Dentition: Early stages of Development	- Physical Development in Preschool years - Maturation of Oral Functions - Eruption chronology of Primary and Permanent teeth - Normal Characteristics of Deciduous, Mixed ands Permanent Dentition	Stages of Embryonic Development - Late Fetal Development and Birth -Preemergent and Post-emergent eruption of teeth	
3.	Development of Dentition: Later Stages of Development	-First transitional period: Eruption of first permanent molar Eruption of incisors Incisor liability Incisor labiality Inter-transitional period Ugly duckling stage Second transitional stage	Theories of tooth eruption Factors affecting eruption of teeth	Chronology of teeth

		Leeway space Late mesial shift Eruption of teeth Clinical applications of growth & development: Arch expansion Ugly duckling Overbite Molar relation		
4.	Occlusion- Basic Concepts	Definition of occlusion Andrews six keys of occlusion Typesof occlusion	Types of cusps Types of curves	
5.	Classification of Malocclusion	Individual tooth malpositions, malrelation of dental arches,skeletal malocclusions,Angle's classification ,Dewey's modifications,Lischers modification,simons classification,Ackerman-Profitt system of classification	Bennettte's classification,Skeletal classification,incisor classification,Katz's premolar classification	
6.	Indices	IOTN Aesthetic component Dental health component	PAR index ICON index	TPI index
7.	Growth and Development : In General, Basic tenets of Growth, Growth Rhythm & Spurts, Terminologies related to Growth, Interpretation of Growth Data	-Definition of Growth and Development -Growth Pattern, Variability And Timing: Cephalocaudal Gradient, Scammons Growth Curve - Methods of Studying Growth - Growth Sites versus Growth Centres	Growth Pattern, Variability And Timing: Standard Growth Charts	

8.	Post natal Growth Cranial base & maxilla	Cortical Drift and Remodelling Elongation of sutures Sutural growth Displacement Growth at Sutures Surface remodelling Timing of growth	Sphenooccipital synchondrosphenoethmoidal synchondrosis intersphenoidalsynchondrosis	
9.	Post natal Growth mandible	Post natal growth of Mandible,primary and secondary displacement,drift,Expanding V principal	Rotation of Jaws during Growth	
10.	Growth theories	Classification Genetic theory Suutural theory Functional matrix theory	Controlling factors of craniofacial growth: Site vs center Van limborgh theory Cartilagenous theory	servosystem
11.	Aetiology of Malocclusion	-Skeletal Growth Disturbances - Disturbances in Dental Development - Genetic Influences	- Environmental Influences	-Percentage prevalence of All malocclusions -Teratogens
12.	Normal and Abnormal Function of Stomatognathic System	Stomatognatics definations and various components,Trajectorial theory of bone formation/Wolff's law,Trajectories of force/Benninghoff's lines,Buccinator mechanism,various functions of stomatognathic system,Masticatio,Deglutination,Speech and malocclusion,		
13.	Habits	- Infantile swallow and Mature Swallow -Retained Infantile Swallow:Causes, Clinical Features and Management.	-Equilibrium Theory and Dental Development	- Cranioverebral Angle

		- Thumb-sucking and Digit Sucking: Causes, Clinical Features and Management. - Mouth Breathing: Causes, Clinical Features and Management. - Bruxism: Causes, Clinical Features and Management.	- Buccinator mechanism - Biting Force and Eruption of teeth:" Short face and Long Face -Respiratory pattern and Adenoid facies	- Obstructive Sleep Apneoa
14.	Genetics in Orthodontics	Twin studies Butler's field theory Malocclusion influenced by genetics Hapsburg jaw family	Pattern of genetic transmission Genetic mutation and disorders Homeobox genes	Mendel'slaw of inheritance Phenotype genotype
15.	Orthodontic Diagnosis: Diagnostic Aids & Case History	Essential and non essential diagnostic aids classification Case history details Body, head and facial types Physiological & functional assessment Symmetry analysis Examination of TMJ	Consent forms & its types	
16.	Orthodontic Diagnosis: Extra-Oral Examination Intra-Oral Examination	-Extra-Oral: Head form, Facial Form, Facial Proportions, Profile Examination, Divergence, Growth Pattern - Intra-Oral: Classification of Malocclusion in all 3 planes, Soft tissue abnormalities, Palate examination - Functional Examination of TMJ, Speech, Respiration, Deglutition.	- Macro/Mini and Micro-esthetics - Throat Form -Golden Proportions - Gingival Proportions -Smile Analysis	-Nose examination -
17.	Orthodontic Photography	Importance of photography in orthodontics Standard views of intra- oral & extra-oral photographs	Preparation of powerpoint for display of photos	Camera specifications

		Components to be examined in different views and their clinical significance		
18.	Orthodontic Study Models:-Importance, Preparation and preservation.	Impression technique Parts of study casts Importance / uses of study casts Clinical significance Classification of model analysis Mixed dentition: Moyer's Permanent Dentition analysis: Bolton's tooth size analysis Ashley Howe's Pont's Carey's Clinical significance of each analysis	Details of plaster casts & base dimensions Cast finishing Gnathostatics's analysis Linderhearth	3 D casts Wax bite records & significance Tanaka Johnson Staley Kerber Radiographic Kesling diagnostic set -up Occlusogram & its clinical significance
19.	Analysis of Orthodontic Study Models: Mixed Dentition & Permanent Dentition	Have covered your part		
20.	Skeletal Maturity Indicators	Requirements for an ideal Maturity indicator,clinical importance,Maturity indicators,radiological methods of assessment and prediction of skeletal growth		
21.	Cephalometrics in General: Types, Uses, Lateral Cephalometric Landmarks & Planes	Cephalometric landmarks Anatomic and soft tissue landmarks Lines and planes in Cephalometrics	Typesof Cephalograms and their uses	Derived landmarks
22.	Cephalometric Analysis: Downs, Steiner's, Tweeds Analysis, Rickett's-E-line, Wit's	Down's analysis,Steiner's analysis,tweeds analysis,Wits appraisal of jaw disharmony.	Rickett's s line	

	Appraisal.			
23.	Biology of Tooth Movement	Changes on force application Optimum orthodontic force Hyalinization Forward resorption backward resorption Phases of tooth movement Theories of tooth movement	Summary of biochemical reactions Physiologic tooth movement	Histology of tooth movement
24.	Messengers of tooth movement	Biochemical reactions to orthodontic tooth movement First messenger Second messenger	Role of arachidonic acid Role of cytokines	
25.	Mechanics of Tooth Movement	Centre of resistance Centre of rotation Moment force Couple Spring characteristics Types of tooth movement Moment ot force ratio in each type of tooth movement	Compression Tension Shear force Bauschinger effect	
26.	Anchorage in Orthodontics	Classification of Anchorage,Sources of anchorage,Anchorage loss,Intraoral anchorage,Extraoral anchorage,muscular anchorage,Implant as anchorage unit Absolute anchorage,	Anchorage planning,Classifying Anchorage requirements,Tweed sClassification of anchorage prepration	
27.	Arch Expansion in Orthodontics	Indications Typesof expansion Difference between slow maxillary expansion and rapid maxillary expansion Skeletal and dental effects of RMEand SME Timing of expansion	Types of RME expanders and slow expanders Retention follow up after expansion Tissue response to	Applied anatomy of palate Diagnostic aids used

		Activation schedule Containdications of Rme	expansion	
28.	Preventive Orthodontics	Rationale Early diagnosis Classification of preventive orthodontic procedures Management of preventive procedures without appliances Space control in deciduous & mixed dentition Space retaining appliances: Removable Fixed Fixed non functional, their uses & contra-indications Mouth guards	Chairside techniques for all fixed space maintaining appliances	
29.	Interceptive Orthodontics.	Definition Procedures such as serial extraction-Indications, contraindications, advantages, diagnostic procedure Correction of developing crossbite Control of abnormal habits Space regaining Muscle exercises	Interception of skeletal malrelations Difference between dental,skelatal and functional crossbite	Different type of appliances for space regainers
30.	Methods of Gaining Space & Extraction in Orthodontics	Proximal stripping(Reproximation),Arch Expansion,Distalisation of molars,Uprighting of molars,Derotation of posterior teeth,proclination of anterior teeth,extractions,	Choice of teeth for extraction,	
31.	General Principles in Orthodontic Treatment	Indications for orthodontic treatment Sequence in treatment planning	Orthodontic triage	

	Planning of Dental and Skeletal Malocclusions	Clinical significance Age considerations in treatment planning Transient malocclusions Functional appliance Adult treatment Clinical significance		
32.	Orthodontic Appliances : General	Classification of orthodontic appliances Advantages, Disadvantages of removable appliances - Ideal requirements of an orthodontic appliancePassive and active appliance Mechanical and myofunctional appliances		
33.	Removable Orthodontic Appliances- Types & Components	Advantages and disadvantages of removable appliances,general principals of removable appliances,Parts of removable appliances (Active components,retentive components,base plate),instructions to the patients	Case selection (Ideal cases of removable orthodontic appliance treatment)	
34.	Removable Appliances-Limited Corrective Orthodontics	Definitions Indications Uses Ideal requisites Clinical management Problems encountered in removable appliance Different types of removable appliances Retractors, spring, bows Factors governing the force		
35.	Fixed Orthodontic Appliances	Advantages Limitations	Archwire & types Springs	Direct & indirect

		Orthodontic band Fabrication of bands Separators Clinical significance of of bands Bonding attachments	Elastics	bonding Lock pins
36.	Orthopaedic Appliances	Definition Basis for orthopaedic appliances Types of orthopaedic appliances Headgears- indications, components types of headgears Facemask- indications, types, parts Chincup- types	Mode of action of orthopaedic appliances	Skeletally Anchored Facemask
37.	Newer Techniques in Orthodontics- TADs, Invisalign, Lasers, Lingual Orthodontics	Intoduction Indications Advantages Disadvantages Basic of TADs	Clinical management of TADS uses	Techniques such as Invisalign Lingual Lasers
38.	Functional Appliances- I- General Principles	Definition Classification Principles Effects of functional appliances: Dentoalveolar, skeletal effects How functional appliances work Advantages & limitations Indications Ideal requirements of functional appliances Instructions on giving functional appliances	Bite registration of functional appliances	History of functional appliances
39.	Functional Appliances- II- Appliances	Case selection Visual treatment objective Vestibular screen - indications, Principle Lip bumper- uses		Fabrication of all functional appliances
40.	Management of Class I	Arch length deficiency management	Extractions in	Factors

	malocclusion: Management of Midline Diastema, Deep Bite, Open Bite & Cross Bite	Procedures to treat midline diastema, deep bite, open bite- removable appliances	orthodontics Procedures to treat midline diastema, deep bite, open bite- fixed appliances Methods of retraction	influencing alignment in fixed treatment Ideal requirements of arch wires Segmented technique of treatment
41.	Management of Class II malocclusion	-Clinical Diagnosis - Growth Modification - Class II Camouflage - Surgical Correction	Early vs Late Class II Correction	Bone Anchorage for Class II Correction
42.	Management of Class III malocclusion	Clinical features,etiological considerations,Correction of Class III Malocclusion,Treatment of preadolescent child,Treatment options for adolescent child,treatment during adulthood.	Surgical treatment options	Envelope of Discrepancy
43.	Principles of Surgical Orthodontics	Definitions Major surgical procedures Minor surgical procedures Surgical treatment options of common deformities Distraction osteogenesis	Indications for surgery Serial extractions Pericision frenectomy-techniques	Presurgical orthodontics Post surgical orthodontics
44.	Orthodontic Management of Cleft Lip and Palate			
45.	Adult Orthodontics	Definition Difference between adult and children Indications	Multidisciplinary approach in treatment	Factors affecting treatment

		Contraindications Biomechanical considerations Diagnosis	Treatment aspects Adjunctive comprehensive	
46.	Retention & Relapse	Causes of Relapse,need for Retention,Schools of thought/philosophies,riedel's theories of retention,classification /types of retainers,Length of retention period		
47.	Materials in orthodontic tooth movement	-Impression Materials -Wrought Metal Alloys- Properties and use -Orthodontic Wires -Acrylics-Composition and Manipulation	-Newer Wire Sytems -Newer Bracket Systems	-Clear Aligners -Lasers in Orthodontics
48.	Smile Considerations in Orthodontics	Assessment of smile Eight components of balanced smile	Typesof smile	Smile design
49.	Ethics in Orthodontics	Ethical considerations in practice Patient Consent form		Plagiarism in writing
50.	Obstructive sleep apnea	Importance of orthodontics in screening, diagnosis & management of OSA	Cephalometric measurements, extraoral features for OSA Removable appliances for OSA	Screening questionnaire for OSA

7. PRACTICAL TRAINING

1. Discussion of 5 Clinical Cases – Each Of DifferentTypes:
   Dentoalveolar Malocclusion: Class I/II/III Malocclusion With: Proclination/Spacingdeep Bite/Open Bite,Etc Skeletal Class II: Growing Individuals Requiring GrowthModification 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 AndSoldering
6. Demostration Of Cephalometric Tracing & analysis
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 orthodonticsappliances.

PRACTICAL EXERCISES REQUIRED TO BE PROFICIENT ABOUT:

- Basic wire bending exercise Gauge 22 or0.7mm

1. Straightening of wire (4Nos)
2. Bending of a equilateraltriangle
3. Bending of arectangle
4. Bending of asquare
5. Bending of acircle

Bending of U.V. Labialbows:

1. Short labialbow
2. Long labialbow
3. Robert'sretractor
4. Split labialbow
5. High labial bow with apron spring CLASPS:
6.

- Construction of clasps (Both sides upper / lower) Gauge 22 or0.7mm
- ¾ clasp(C-Clasp)
- Full clasp (Jackson's Crib)
- Adam'sclasp
- Triangularclasp

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

A. Fingerspring
B. Single cantileverspring
C. Double cantilever spring (Z-spring)

- Construction of canineretractors

A. Buccal canineretractor
B. Helical canineretractor
C. U loop cnine retractor
D. Palatal canineretractor Appliances:
A. Upper hawley'sappliance
B. Upper hawley's appliance with anterior biteplane
C. Upper hawley'sappliance
D. With tonguespikes
E. Upper hawley's retainerappliance

8. THEORYEXAMINATIONS

Elaborateon	2 X 10 =	20Marks
Write Notes on	10 X 5 =	50Marks
		70 Marks

9. PRACTICALEXAMINATIONS

Marks Total

1. Objective structured clinical examination (OSCE): 40 marks including workstations for spotters and clinical case simulation. 60 (6x10) marks
2. Working Skill Wire Bending Skill

Adam's Clasp : 10 Marks
LabialBow : 10Marks
Spring : 10 Marks
30Marks
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90 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.

<u>IA will be based on:</u>

1) wire bending exercise/ assignment completion
2) Attendance in Lab classes andclinical
3) clinical assignment completion ontime
4) patient care – ethics , communication, behaviour ,responsibility

11. RECORD NOTE / LOGBOOK

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. TEXTBOOKS

1. Essentials Of Orthodontics By Neil TReske
2. Removable Orthodontic Appliances By PhilipAdams
3. Text Book Of Orthodontics By Samir EBishara
4. Wire Bending ByDickson
5. Dental Materials By AnuSavice
6. Understanding Orthodontics ByPerry
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 ByIsaacson
11. Principles And Practice Of Orthodontics By J R EMills

13. ReferenceBooks

1. ContemporaryOrthodontics - WilliamProffit
2. Orthodontics ForDentalStudents - White AndGardiner
3. HandbookOfOrthodontics - Moyers
4. Orthodontics – PrinciplesAndPractice - Graber
5. Design, Construction And Use Of Removable Orthodontic Appliances - C. PhilipAdams
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 5patients
2. Laboratory techniques including wire-bending for removable appliances, soldering and processing of myo-functional appliances.
3. Treatment of plan options anddecisions.
4. Making of bands, bonding procedures and wireinsertions.
5. Use of extra oral anchorage and observation of forcevalues.
6. Retainers.
7. Observe handling of patients with oral habits causingmalocclusions.

The dental graduates shall do the following laboratory work:-

1. Wire bending for removable appliances and space maintainersincluding weldoing and heattreatmentprocedure. -5Cases
2. Soldering exercises, banding&bondingprocedures -2Cases
3. Cold-cure and heat-cure acrylisation of simpleOrthodonticsappliances -5Cases

Period of Postings
Orthodontics - 1 Month

17. PERIODONTOLOGY

1. GOAL:

To educate and impart the optimum knowledge about the subject of Periodontology to the students as per the latest DCI Regulations for the BDS course under the "Must know" category. To sensitize them about the latest and the current innovations and researches going on in the field of Periodontics under the "Desirable to know and "Nice to know" category.

2. OBJECTIVES:

a. Knowledge and understanding:

Students should have adequate knowledge and understanding about the periodontal tissues in health and disease, the etiopathogenesis of various periodontal diseases, diagnosis, treatment planning, and management of various periodontal diseases and conditions.

b. Skill:

To be able to record complete and systematic clinical history, perform thorough clinical examination, choose appropriate diagnostic procedures, to advise necessary laboratory and radiographic investigations and interpret the findings, to reach to a provisional diagnosis of the periodontal disease or condition.

To be able to acquire and apply optimum skills while performing various treatment procedures.

To be able to communicate well with the patients so as to develop a positive attitude towards his/ her oral hygiene care.

c. Attitude:

To develop an attitude in the student to perform the periodontal treatment after following the ideal principles of instrumentation and infection control, to perform the procedure in a minimally invasive manner, to avoid creating any iatrogenic diseases and conditions, to educate and motivate the patient about the optimal home care and reinforce the concept of regular follow-ups by the patient. To understand the importance of interdisciplinary care and seek expert consult and referral wherever required.

d. Integration:

To deal and study the body as a whole and understanding the implications of various systemic conditions on the oral health. To have a wider perspective about treating a patient as a whole rather than having a localized view in the oral cavity so as to diagnose or pick certain conditions and diseases much before developing into full blown diseases and disorders.

e. Knowledge about infection and cross infection in dentistry:

A thorough knowledge about the Sterilization and disinfection of the instruments, and the operatory. Technical knowledge about the functioning of autoclaves and various equipments; qualitative and quantitative assessment of the same. To know all the means of personal infection control and methods of cross-infections. To have knowledge about the ideal methods of biomedical waste disposal and management, special care about the protocol to be followed in case of accidental contaminated sharp needle injury and its registry.

f. Computer proficiency:

To have a knowledge about accessing the e-journals and the scientific literature. To have basic knowledge about power-point presentations for seminar and scientific poster presentations. To have basic knowledge about Statistics softwares.

3. COMPETENCIES:

1. General clinical skills backed with thorough theoretical knowledge.
2. Good communication and motivational skills
3. To be able to diagnose the periodontal disease/ condition correctly
4. To be able to plan an appropriate treatment plan and execute the same
5. To be competent enough to successfully perform thorough oral prophylaxis, root planning and minor surgical procedures
6. To give proper post treatment instructions and do periodic recall and evaluation
7. To be familiar with basics of concepts of osseointegration and basic surgical aspects of Implantology

4. TEACHING HOURS

Lecture Classes:

BDS III rd Year - 30 Hrs
BDS IVth Year - 50 Hrs
Total – 80 hours

Clinical Hours:

BDS III rd Year - 70 Hrs
BDS IVth Year - 100 Hrs
Total – 170 hours

5. TEACHING METHODOLOGY

TUTORIALS

BDS 3RD YEAR

1. Students are taught and instructed to maintain strict Infection Control in the Clinics
2. Students are taught about the various Periodontal instruments- their design, usage, applications, cleaning, washing and sterilization.
3. Detailed demonstrations are given about the various chair positions while working and the principles of Instrumentation is demonstrated. Main emphasis is given about the ergonomics.
4. Maintenance of Instruments (sharpening) is taught.
5. Case history taking, determination of diagnosis, prognosis, and treatment plan of gingivitis and periodontitis cases
6. Motivation of patients- oral hygiene instructions are given to every patient. Patients are demonstrated the correct brushing method on a dental model on the first visit as per individual needs. On the second visit or the day of appointment, professional brushing is demonstrated.
7. Scaling and root planing is demonstrated on patients.
8. Demonstration of Periodontal Abscess drainage.
9. Demonstration of Gingival curettage

BDS 4th YEAR

1. Students are taught and reinforced strict Infection Control in the Clinics
2. Ultrasonic scaling-demonstration of technique.
3. Diagnosis of advanced periodontal disease, determination of prognosis and treatment planning.
4. Radiographic and Laboratory investigations' interpretation.
5. Education and Motivation of patients about oral hygiene reinforced.
6. Patients are instructed and demonstrated the proper use of Mechanical and chemical Plaque control methods as per the needs.
7. Proper method of usage of Local drug delivery systems, Gum paints and desensitizing agents are demonstrated and taught as per the clinical case.
8. Detailed periodontal case history taking, determination of diagnosis, prognosis, and treatment plan of Periodontal Surgical cases.
9. Assistance of major and minor periodontal surgical procedures like, gingivoplasty, frenectomy, frenotomy, vestibuloplasty, and flap surgeries.

DEMONSTRATIONS:

BDS 3RD YEAR

1. History taking and clinical examination of patients.
2. Recording different clinical Periodontal indices.
3. Methods of using various scaling and surgical instruments.
4. Demonstration to the patients about different oral hygiene aids.
5. Demonstration of periodontal abscess drainage and irrigation.

BDS 4th YEAR

1. History taking and clinical examination of patients.
2. Recording different clinical periodontal indices.
3. Methods of using various scaling and surgical instruments.

4. Demonstration to the patients about different oral hygiene aids.
5. Root planning and curettage.
6. Follow-up procedures, post operative care and supervision.
7. Surgical procedures: Gingivectomy, Gingivoplasty, frenectomy, frenotomy, vestibuloplasty, and flap surgeries.
8. Applications of Soft tissue Lasers and Electrocautery.

REQUIREMENTS:

List of instruments required

S. no.	Instrument	Quantity
1	Diagnostic instruments (Mouth Mirror, Explorer, William's graduated probe, Tweezer)	4 each
2	Naber's probe	1
3	Supral and Sub- Ginigival Scalers (API)	4 sets
4	Kidney tray	4
5	Instrument tray (steel)	1
6	Cotton holder and receiver	1 each
7	Dappen dish	2
8	Patient's drape	4

9	Hu-friedy U 15/30 Scaler	2
10	Hu-friedy Universal curette-2R-2L and 4R-4L	2
11	Towel clips	2
12	Face mirror	1
13	Model, toothbrush and disclosing solution	1 each
14	Green cloth (2 ft. by 2 ft.)	6

Clinical Quota for BDS Third Year

1. Written Work in the manual is to be Completed
2. Motivation, Education And Supragingival Scaling of 20 Patients
3. Case History of Gingivitis for 2 Patients
   and Periodontitis for 2 Patients

Clinical Quota for BDS Final Year

1. Supragingival and Subgingival Scaling- 25 Patients
2. Surgical Case preparation – 4 patients having periodontal disease in which student has to do the following –
   a. Case History taking
   b. Make study models
   c. Clinical photographs – Pre-scaling and Post - scaling and Root planing
   d. Scaling and Root planning
   e. Gingival curettage.

6. THEORY SYLLABUS

TOPIC	MUST KNOW	DESIRABLE TO KNOW	NICE TO KNOW
THIRD BDS Lecture classes:	1. Introduction to Periodontology, Periodontics, brief historical background		
	2. Micro-structural anatomy, biology and development of periodontal tissues: Gingiva, periodontal ligament, Cementum, Alveolar bone		
	3. Age changes in periodontal structures and their significance in Geriatric dentistry		
	4. Classification of Periodontal diseases: need and significance of classification, classification of gingival and periodontal diseases as described in World Workshop 1999 and the latest Classification of Periodontal and Peri-Implant Diseases and Conditions 2017		• Classification of Gingival and Periodontal diseases as described in World Workshop 1989
	5. Epidemiology of Periodontal Diseases: Definition of Index, Incidence, Prevalence, epidemiology, various Periodontal Indices, Detailed understanding of Silness & loe Plaque Index, Loe & Silness Gingival Index, CPITN index; prevalence of periodontal deiseases in India and other countries.		
	6. Defensive mechanisms in the oral cavity: role of epithelium, Gingival crevicular fluid, saliva and other defensive mechanisms in the oral cavity		• Significance of GCF and saliva as diagnostic aids and disease predictors

	7. Gingival inflammation: etiology, pathogenesis		
	8. Clinical features of Gingivitis: stages of Gingivitis		
	9. Gingival enlargement: classification and differential diagnosis		
	10.Acute Gingival conditions		
	11.Gingival diseases in childhood		
	12.Desquamative Gingivitis		
	13.Extension of Inflammation from Gingiva: Periodontal Pocket- definition, signs and symptoms, classification, etiopathogenesis, histopathology, root surface changes, and the contents of the pocket		
	14.Bone loss and patterns of bone destruction		
	15.Periodontal response to external forces: definitions, types, histopathologic changes, role in periodontal disease, measures of management in brief.		
	16.Chronic Periodontitis		
	17.Necrotizing Ulcerative Peridontitis		
	18.Aggressive Periodontitis		
	19.Pathology & management of Periodontal problems in patients with HIV infections		

	20.Masticatory system disorders and role of parafunctional habits in periodontal diseases, Food impaction: Definition, types, etiology, classification, signs & symptoms, and sequelae to treatment		
	21.Periodontal pathogenesis		
	22.Role of Dental Calculus: definition, types, composition, attachment, theories of formation; and other local predisposing factors		
	23.Periodontal Microbiology: Dental Plaque-definition, new concept of biofilm, types, composition, bacterial colonization, growth, maturation, role of dental plaque in periodontal disease, Role of various microbes in periodontal diseases.		
	24.Genetic factors and Periodontal diseases		
	25.Molecular biology of the Host-Microbe Interaction in periodontal diseases		
	26.Smoking and Periodontal disease		
	27.Influence of Systemic conditions on the periodontium		
	28.Impact of Periodontal Infection on Systemic Health		
	29.Oral malodor		
FINAL B.D.S.	1. Clinical Diagnosis: Routine clinical procedures, methods of probing, types of probes, advanced diagnostic aids in		• Generations of periodontal probes

	brief, radiographic aids in the diagnosis of periodontal disease		
	2. Clinical risk assessment		
	3. Determination of prognosis: Definitions, types, purpose and factors to be taken in consideration		
	4. Treatment plan		
	5. Rationale for Periodontal treatment		
	6. Levels of Clinical significance		
	7. Periodontal Treatment of Medically Compromised patients		
	8. Periodontal Treatment of Female patients		
	9. Periodontal Treatment for Older patients		
	10.Treatment of Aggressive and Atypical forms of Periodontitis		
	11.Treatment of Acute Gingival Diseases		
	12.Treatment of Periodontal Abscess		
	13.Phase I Periodontal Therapy		
	14.Plaque control for the periodontal patients: mechanical & chemical aids		
	15.Scaling and Root planing		
	16.Sonic and Ultrasonic Instrumentation and Irrigation		

	17.Antiinfective therapy		
	18.Host Modulation		
	19.Occlusal evaluation and Therapy	• Various Periodontal Splints: classification, purpose, Principles	
	20.Adjunctive role of Orthodontic therapy		
	21.Diagnosis and management of Endodontic-Periodontic Lesions		
	22.Phase II Periodontal Therapy		
	23.Surgical anatomy of Periodontal and Implant areas		
	24.General principles of Periodontal Surgery	• Various suturing techniques • Hypersensitivity: theories and its management	• Management of various minor complications during the intra-operative and post-operative surgical phase • Conscious sedation
	25.Gingival surgical techniques: gingival curettage, gingivectomy, gingivoplasty, frenectomy, frenotomy and their healing		
	26.Periodontal flap surgery and the flap technique for pocket therapy		
	27.Treatment of Gingival Enlargement		

	28.Resective osseous surgery		
	29.Reconstructive Periodontal Surgery		• Advances in periodontal regenerative procedures
	30.Furcation involvement and treatment		• Minimally invasive periodontal therapy
	31.Periodontal Plastic and Esthetic Surgery		• Advances in techniques and biomaterials used for plastic periodontal surgery
	32.Recent advances in Surgical Technology: Lasers, applications of Magnification and Microsurgery	• Stems Cells and Tissue Engineering and its application in Periodontics	• Piezosurgery and its applications
	33.Inter-disciplinary care: preparation of periodontium for restorative dentistry and prosthodontics, concept of Biologic width, Crown lengthening		
	34.Oral Implantology: periimplant anatomy and biology, biomaterials used. Periodontal considerations, surgical procedures, biomechanics, implant related complications and failures	• Computer assisted implant surgery	• Applications of advances diagnostic imaging in implant dentistry
	35.Supportive Periodontal Treatment: aims, objectives, principles, procedures		

	36.Dental Ethics		• Legal principles

4. THEORY EXAMINATION (3Hours)

Comprise of long and short questions of total 70 marks

]Theory Viva = 20marks

5. PRACTICALS/ CLINICALSEXAMINATIONS

Clinical procedures

1. Case sheet writing for the given case
2. Scaling
3. Spotters-Instruments, Radiographic interpretation
4. chair side viva

0f total 90 marks

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

10. INTERNALASSESSMENT

The internal assessment examination to be held regularly and the aggregate of the examinations are considered for annual examination,

11. TEXTBOOKS

Carranza's Clinical Periodontology by Newman et al

12. REFERENCEBOOKS

i. ClinicalPeriodontology&implantology by JanLindhe
ii. Contemporary Peridontics by Robert Genco Henry Goldman
iii. Essentials of Periodontology and periodontic TorquilMacPhee
iv. Contemporary Periodontics –Cohen
v. Periodontal therapy –Goldman
vi. Orbans' periodontics –Orban
vii. Oral Health Survey –W.H.O.
viii. Preventive Periodontics – Yound andStiffler
ix. Public Health Dentistry – Slack
x. Advanced Periodontal Disease – JohnPrichard
xi. Preventive Dentistry –Forrest
xii. Periodontics – Baer &Morris.

CRI POSTING SCHEDULE AND ORIENTATION

A. The dental graduates shall perform the following procedures

1. Prophylaxis	15cases
2. Flap Operation	2cases
3. Root Planing	1case
4. Curettage	1case
5. Gingivectomy	1case
6. Perio-Endocases	1case

Period of Postings

Periodontics - 1 Month

18. PROSTHODONTICS INCLUDING 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.

3. COMPETENCIES

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

4. TEACHING OURS

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
f) Integrated Teaching
g) Symposium and continuing dental education programmes

THEORY SYLLABUS

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. • Immediat e 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.

6. PRACTICALS

Procedures: It includes fabrication of the following Complete Dentures - 4

Removable Partial Dentures - 10

Demonstrations

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

7. THEORY EXAMINATION (3 Hours)

(Two parts each of 35 marks)

Elaborate on	2 X 8	= 16 marks
Write Notes	6 X 5	= 30 marks
Short Notes	8 X 3	= 24 marks
Total		70 marks

Theory Viva 20 marks

Total: 90 Marks

8. PRACTICAL / CLINICAL EXAMINATIONS –: Total: 90 Marks

FINAL YEAR:

COMPLETE DENTURE:

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

FIXED PROSTHODONTICS:

1. Tooth preparation in Articulated artificial teeth: 25 Marks - 60 Minutes

PRACTICAL 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 3 times in a particular year. The marks scored by the students will be displayed on the Notice board and a copy forwarded by HOD will be sent to the authorities.

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. Planning of cast partial denture	1
5. Miscellaneous-like reline/rebasing/ repair / overdenture/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

19. CONSERVATIVE DENTISTRY AND ENDODONTICS

OBJECTIVES:

A. Knowledge and understanding

B. Skills and

C. Attitudes

A). Knowledge and understanding:

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

i. To diagnose and treat simple restorative work for teeth.

ii. To gain knowledge about aesthetic restorative material and to translate the same to patients needs.

iii. To gain the knowledge about endodontic treatment on the basis of scientific foundation.

iv. To carry out simple endodontic treatment.

v. To carry out simple luxation of tooth and its treatment and to provide emergency endodontic treatment.

SKILLS:

He should attain following skills necessary

i) To use medium and high speed hand piece to carry out restorative work

ii) Poses the skills to use and familiars endodontic instruments and materials needed for carrying out simple endodontic treatment

iii) To achieve the skills to translate patients esthetic needs along with function.

ATTITUDES:

i). Maintain a high standard of professional ethics and conduct and apply these in all aspects of professional life.

ii). Willingness to participate in CDE programmes to update the knowledge and professional skill from time to time.

iii).To help and participate in the implementation of the national oral health policy.

iv).He should be able to motivate the patient for proper dental treatment at the same time proper maintenance of oral hygiene should be emphasized which will help to maintain the restorative work and prevent future damage.

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.

7. TEACHINGHOURS

Subject	Lecture Hours	Practical Hours	Clinical Hours	Total Hours
Conservative Dentistry & Endodontics BDS IIIrd and IVth year	135	200	370	705

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

- Rotary endodontics
- RVG
- Thermoplasticized guttapercha
- Rubber dam application
- Bleaching of vital/non vital teeth
- Cast post
- Diastema closure
- Rubber base impression

8. 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.

MARKS DISTRIBUTION:

Each subject shall have a maximum of 200 marks.

Theory 100

University written exam 70

Viva Voce 20

Internal assessment (Written) 10

Total 100

Practical/ Clinical 100

University Exam 90

Internal assessment (Written) 10

Total 100

THEORY SYLLABUS INCLUDING BIO-ETHICS AND JURISPRUDENCE

SN	Must Know	Desirable To Know
1.	Definition aims objectives of Conservative Dentistry scope and future of Conservative Dentistry. 1. Nomenclature Of Dentition: • Tooth numbering systems A.D.A. Zsigmondy Palmer and F.D.I. systems 2. Principles Of Cavity Preparation : • Steps and nomenclature of cavity Preparation • Classification of cavities • Nomenclature of floors angles of cavities. 3. Dental Caries : • Aetiology, • Classification clinical features • Morphological features, microscopic features • Clinical diagnosis and sequel of dental caries. 4. Treatment Planning For Operative Dentistry: • Detailed clinical examination , • Radiographic examination • Tooth vitality tests • Diagnosis and treatment planning • Preparation of the case sheet. 5. Gnathological Concepts Of Restoration • Physiology of occlusion, normal occlusion	. Management of dental clinic.

	• Normal occlusion, Ideal occlusion, mandibular movements and occlusal analysis • Occlusal rehabilitation and restoration. 6. Aramamentarium For Cavity Preparation: • General classification of operative instruments • Hand cutting instruments design formula and sharpening of instruments • Rotary cutting instruments dental bur,mechanism of cutting ,evaluation of hand piece and speed current concepts of rotary cutting procedures. • Sterilization and maintenance of instruments. • Basic instruments tray set up. 7. Control of Operating Filed: • Light source • Sterilization • Field of operation • Control of moisture: rubber dam in detail, cotton rolls and anti Sialogagues. 8. Amalgam Restoration: • Indication contraindication, • physical and mechanical properties , clinical behavior • Cavity preparation for Class I, II, V and III. • Step wise procedure for cavity preparation and restoration • Failure of amalgam restoration. 9. Pulp Protection :	lasers in conservative (introduction only) Recent advances in amalgam restoration Recent advances in new materials eg. MTA, Biodentine etc.

	Liners, varnishes and bases • Zinc phosphate, Zinc phosphate, zinc polycarboxylate, zinc oxide eugenol and glassionomer cements. 10. Anterior Restorations : • Selection of cases • selection of material • step wise procedures for using restorations • Glass ionomers, composite including sand witch restorations and bevels of the same with a note on status of the dentine bonding agents • Nanotechnology • Aesthetic dentistry 11. Direct Filling Gold Restorations : • Types of direct filling gold indications and limitations of cohesive gold. • Annealing of gold foil cavity preparation and condensation of gold foil. 12. Preventive Measures In Restorative Procedure • Plaque Control, • Pit and fissure sealants • Dietary measures restorative procedure and periodontal health. • Contact and contour of teeth and restorations. • Matrices tooth separation and wedges. 13. Temporisation or Interim Restoration.	

	14. Pin Amalgam Restoration Indication Contra indication • Advantages disadvantages of each type of pin methods of placement use of auto matrix. • Failure of pin amalgam restoration. 15. Management Of Deep Carious Lesion: • Indirect And Direct Pulp Capping. 16. Non Carious Destruction's Tooth Structure 17. Hyper Sensitive Dentine And Its Management 18. Cast Restorations : • Indications, contra indications, Advantages and disadvantages and materials used for same Class II and Class I cavity preparation for inlays , fabrication of wax pattern spurring inverting and casting procedures & casting defects 19. Die Materials And Preparation Of Dies. 20. Gingival Tissue Management For Cast Restoration And Impression . 21. Recent Cavity Modification Amalgam Restoration. 22. Differences between Amalgam And Inlay Cavity preparation with note on all the types of Bevels	Role of Magnification in Endodontics

	used for Cast Restoration. 23. Control Of Pain During Operative Procedures. 24. Treatment Planning For Operative Dentistry including Detailed Clinical Examination Radiographic Examination 25. Vitality Tests, Diagnosis And Treatment Planning And Preparation Of Case Sheet. 26. Applied Dental Materials: Biological Considerations, Evaluation, clinical application and adverse effects of the following materials. • Dental cements, Zinc oxide euginol cements zinc phosphate cements, polycarboxylates, glass ionomer cements, silicate cement calcium hydroxides varnishes. • Dental amalgam, technical considerations mercury toxicity mercury hygiene • Composite, Dentine bonding agents, chemical and light curing composites • Rubber base Imp. Materials • Nobel metal alloys & non noble metal alloys • Investment and die materials • Inlay casting waxes • Dental porcelain • Aesthetic Dentistry **Endodontics:** • Endodontics	lasers in Endodontics (introduction only)

	• Introduction • Definition • Scope and future of endodontics 2. Clinical diagnostic methods 3. Emergency endodontic procedures 4. Pulpal diseases • Causes • Types • Treatment . 5. Periapical diseases: • Acute periapical abscess • Acute periodontal abscess • Phoeix abscess, • Chronic alveolar abscess • Granuloma cysts • Condensing osteitis, • External resorption. 6. Vital pulp therapy: • Indirect and direct pulp capping • Pulpotomy different types and medicaments used • Problem of open apex • Apexogenisis • Apexification 8. Rationale of endodontic treatment • case selection • indication and contraindications for root canal	Updating students with new materials eg. MTA, Biodentine etc. being introduced in markets and their pros and cons.

	treatment 9. Principles of root canal treatment • Mouth preparation • Root canal instruments, • Hand instruments, power driven instruments, • Standardization color coding principle of using endodontic instruments. • power driven instruments, standardization color co • Sterilization of root canal instruments and materials • Rubber dam application. 10. Anatomy of the pulp cavity & root canals apical foramen • Anomalies of pulp cavities • Access cavity preparation of anterior and premolar teeth. 11. Preparation of root canal space including: • Determination of working length, • Use of apex locators • Cleaning and shaping of root canal • Irrigating solution chemical aids to instrumentation. 12. Disinfection of root canal space : • Intracanal medicaments • poly antibiotic paste	

	• Mummifying agents • Outline of root canal treatment • Bacteriological examinations • Culture methods. 13. Problems during cleaning and shaping of root spaces • Perforation and its management • Broken instruments and its management • Management of single and double curved root canals. 14. Methods of cleaning and shaping like step back crown down and conventional methods. 15. Obturation of the root canal system. • Requirement of an ideal root canal filling material • Obturation methods using gutta percha • Healing after endodontic treatment • Failures in endodontics. 16. Root canal sealers: • Ideal properties • Classification • Manipulation of root canal sealers. 17. Post endodontic restoration: fabrication and components of post core preparation. 18. Smear layer and its importance in endodontics and	

	conservative treatment 19. Discoloured teeth and its management: • Bleaching agents • Vital and non vital bleaching methods. 20. Traumatised teeth classification of fractured teeth: • Classification of fractured teeth • Management of fractured tooth and root • Luxated teeth and its management. 21. Endodontic surgeries: • Indication contraindications • pre operative preparation • Pre medication surgical instruments and techniques apicectomy • retrograde filling • post operative sequale • Terphination hemisection • Radiscetomy techniques of tooth • Reimplantation (both intentional and accidental) • Endodontic implants. 22. Root resorption. 23. Emergency endodontic procedures.	

Biomedical Ethics	• Respect Human Life and the Dignity of Human Individual • Refrain From Supporting or Committing Crimes against Humanity and Condemn all such acts • Treat the Sick and Injured with Competence and Compassion • Protect the Privacy and Confidentiality of those whom we care. • Work Freely with Colleagues • Educate the public • Teach and mentor those who follows	Practice management Financial management of practice. Dental material and basic equipment management.

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 3months.

Internal assessment: 10

9. RECORDBOOK

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.

10.TEXTBOOKS

DENTAL MATERIALS

1 Phillips Science of Dental Materials – 10th edn.- Kenneth J. Anusavice
2 Restorative Dental Materials - 10 edn. Robert G.Craig
3 Notes on Dental Materials - E.C. Combe
4 Prep. Manual for undergraduates – Dental Materials – Dr. M.S. Koudi & Dr. SanjayGouda B. Patil

CONSERVATIVE DENTISTRY AND ENDODONTICS

6. The Art & Science of Operative Dentistry, Sturdevant, MosbyU.S.A
7. Pickard's manual of operative dentistry
8. Principle & Practice of Operative Dentistry, Charbeneu, Varghese Publishing, Mumbai.
9. Grossman's Endodontic Practice, B. Suresh Chandra &V. GopiKrishna, Wolters Kluwer
10. Textbook of Operative Dentistry. Sikri Vimal K, CBS Publishers & Distributors Private Limited

REFERENCEBOOKS

5) Introduction to Dental Materials, VanNoort,

6) Applied Dental Materials, McCabe,

7) Ingle's textbook ofendodontics

8) Cohen's Pathways ofPulp

9) Fundamentals of Operative Dentistry: A Contemporary Approach-James b. Summit

ORAL AND MAXILLOFACIAL SURGERY

1. **Aim:**

To train a dental graduate student in competencies of oral surgical procedures under local and general anesthesia, acquire reasonable knowledge of oral maxillofacial diseases, injuries and infections, formulate appropriate treatment plan and perform basic oral surgical procedures with confidence and the ability to manage complications.

2. **Objectives:**

   a. **Knowledge and understanding**

      i. Diagnose, treat and manage patients with oral surgical needs
      ii. Gain knowledge about infection and cross- infection in dentistry
      iii. Understand the principles of in-patient management
      iv. Gain knowledge of a range of traditional as well as modern surgical procedures
      v. Awareness about ethical and medico-legal issues in dentistry

   b. **Skill**

      i. Be able to diagnose complex oral surgical problems and seek specialist opinion or treatment
      ii. Be able to advise and interpret appropriate clinical and laboratory diagnostic investigations and formulate differential diagnosis

iii. Learn the art of doctor-patient communication skills

iv. Be able to assess, manage and prevent complications during and after oral surgery

v. Able to provide primary care and manage medical emergencies in the dental office

c. Integration

i. Integrate knowledge gained in basic medical sciences in management of patients with oral surgical problems

d. Computer proficiency

i. Basic computer proficiency .

3. Teaching hours:

Teaching	Third year	Final year
Theory	25 hours	80 hours
Clinical	100 hours	150 hours

4. Teaching Methods:

1. Traditional classroom teaching
2. Multimedia, online lectures
3. Small group discussions
4. Clinical chairside teaching
5. Supervised clinical activity
6. Demonstration of clinical procedures
    a. Third year
        i. Oral Surgery instrument use
        ii. Local anesthetic techniques – maxillary and mandibular nerve blocks
        iii. Intra-alveolar extraction technique
        iv. Aseptic techniques in oral surgery – universal precautions
    b. Final year
        i. Oral Surgery instrument use – elevators and forceps
        ii. Local anesthetic techniques – all maxillary and mandibular nerve blocks
        iii. Intra-alveolar extraction techniques
        iv. Trans-alveolar extraction technique
        v. Surgical removal of impacted teeth

vi. Wiring techniques

vii. Arch bar fixation, IMF

viii. Suturing techniques

ix. Instrument care and sterilization

x. IM and IV injections

xi. Dental implants

xii. Minor oral surgery – apicectomy

xiii. Minor oral surgery – alveoloplasty

xiv. Minor oral surgery – bone grafting

xv. Minor oral surgery – cyst removal (enucleation and marsupilization)

xvi. Minor oral surgery – small benign tumor excision (fibroma, lipoma)

xvii. Minor oral surgery – soft and hard tissue biopsy

5. **Theory Syllabus**:

Third year

Topic	**Must Know**	**Desirable to**

		know
Introduction	Definition, aims, objectives and scope of Oral and Maxillofacial Surgery	
Diagnosis in oral surgery	History taking and prescription of investigation	
Infection control	Principles of infection control, Asepsis, sterilization, patient preparation, universal precautions, cross infection, HIV/AIDS prophylaxis	
Local Anesthesia	Pain pathway and mechanism, definition and types of LA, indications, contraindications, advantages and disadvantages, ideal properties, classification, mechanism of action, composition, maximum dose, vasoconstrictors and modes of anesthesia Complication of LA – causes, clinical features, diagnosis, prevention and management Local anesthetic techniques – maxillary nerve blocks, mandibular nerve blocks, techniques of LA and infiltration	Newer LA agents
Exodontia	Definition, indication, contraindications, methods of exodontias, types of movements Dental elevators – uses, principles, types and method of use Complications of exodontia – causes, clinical features, diagnosis, management and prevention	Luxators – principles, types, methods of use
Principles of	Mucoperiosteal flaps, principles of flap design, Extra oral skin	Skin staples,

Oral Surgery	incisions, hemorrhage and shock, drainage and debridement, incision and drainage, wound management Suturing – principles, suture materials. Classification, tissue response Postoperative care, pain control, antibiotics and analgesic	adhesives, surgical dressings,
Impacted teeth	Definition, etiology, classification, indication, contraindication, assessment, difficulty index, investigations and interpretation, methods, flaps, bone removal – methods, steps of transalveolar impaction, complication Maxillary canine – reasons, localization, flaps, methods, indications, surgical exposure, transplantation	

Final year

Topic	**Must Know**	**Desirable to know**
Cystic Lesions of Jaws	Definition, Classification, pathogenesis Diagnosis, clinical features, radiological, aspiration biopsy, use of contrast media and histopathology Management- Types of Surgical procedure, rationale of the technique, indications, procedure and complications.	

Tumours of the oral cavity	General considerations, Classification, general principles of amnagement 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, indications, contraindications, procedure	Role of dental surgeons in the prevention and early detection of oral cancer
Dento-alveolar Surgery	Trans alveolar extraction, impacted teeth: General factors, incidence. Aetiology, classification, Indications, Assessment: Clinical & radiological, Anaesthetic considerations, Surgical procedures Endodontic surgery: Intorduction, classification, apiceoctomy, replantation	
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.	
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 Fractures of middle third of the face, Definition of mid-face, applied surgical anatomy, classification, clinical features and outline of management Classification, clinical features, Indications for treatment, Various methods of reduction and fixation Alveolar fractures- methods of management Management of fracture of condyle-aetiology, classification, clinical features and general principles of management reduction and fixation Orbital fractures & fractures of Zygomatic complex	
TMJ disorders	Surgical anatomy. Myofunctional pain dysfunction syndrome aetiology, clinical features management, nonsurgical and surgical Ankylosis- definition, aetiology, clinical features and management. Dislocation- Types, aetiology, clinical features and management Internal derangement & Arthritis and other disorders	
Diseases of maxillary sinus	Surgical anatomy, Acute & chronic sinusitis Surgical approach of sinusitis- Caldwell-luc procedures, removal of root from the sinus Oro –antral fistula- aetiology, clinical features and various surgical methods of closure	

Pre-prosthetic surgery	Introduction, aims Definiton, classification of procedures. (a) Corrective procedures: Alveiloplasty, 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. Indication, 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 surgery

Emergency drugs	Intramuscular iv injections, applied anatomy, ideal location of giving these injections, techniques etc.	
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 and equipment	
Oral Implantology	Principles of Implantology, sinus lift procedure, types of implants, basic surgical steps,	
Orthognathic surgery	Basic forms, prognathism, retrognathism and open bite. Reasons for correction, Outline of surgical methods carried out on maxilla and mandible – BSSO, IVRO, AMO, Subapical, Genioplasty, Leforte I, II, III osteotomy	
Space infections	Anatomy of spaces, etiology, clinical features, diagnosis and management of each space infection Ludwigs angina – etiology, clinical features, medical and surgical management. Antibiotic stewardship, principles of antiobiotic administration, culture sensitivity Osteomyelitiis – classification, clinical features, diagnosis and management Osteoradionecrosis	
Oral	Classification, TNM staging, clinical features, grading, general	

malignancy	principles of treatment, prognosis Squamous cell carcinoma – etiology, risk factors, molecular basis for carcinogenesis, clinical presentation, surgical management – maxillectomy, mandibulectomy, resection and reconstruction Basics of chemotherapy and radiotherapy	
Dental Ethics		Basic principles, ethics of practice management, case studies
Surgical considerations in clinic design and practice management	(Additional topic)	Space management, required equipment, instrument and medication,
Recent technology in oral Surgery	(Additional topic)	Peizoelectric unit, navigation surgery, magnetic hammer, physics forceps, endoscopic surgery, CADCAM stereolithography

6. Practical Syllabus

Third year

1. Case history taking
2. Patient examination and diagnosis
3. Recording of blood pressure
4. Use of oral surgical instruments
5. Administration of local anesthesia
6. Extraction of mobile teeth
7. Patient follow up
8. Model - wiring technique
9. Model – suturing technique

Final year

1. Case history taking
2. Patient examination and diagnosis
3. Recording of blood pressure
4. Use of oral surgical instruments
5. Administration of local anesthesia
6. Extraction of erupted teeth
7. Transalveolar extraction of fractured teeth
8. Management of complications of LA and exodontia
9. Assist cases of disimpaction, preprosthetic surgery, incision and drainage, closed reduction of fractures, IMF

10. Training in basic life support skills

7. Practical quota

Clinical exercise	**Quota**
Uncomplicated Extractions	100
Complication extractions	10
Minor oral surgical procedures (I&D, IMF, preprosthetic etc)	5 (assist)
Dental implants	5(observe)
IM and IV injections	5
Management and reporting of medical emergency in dental office	5

8. Recommended Books

a. Local Anesthesia; Monheims

b. Textbook of Local Anesthesia; Malamed S

c. Impacted Teeth; Alling John F et al

d. Principles of oral and maxillofacial surgery; Vol 1,2 &3 Peterson LJ et al

e. Text book of oral and maxillofacial surgery; Neelima Anil Mallik

f. Handbook of medical emergencies in the dental office; Malamed SF

g. Killeys Fractures of the mandible; Banks P.

h. Killey's fractures of the middle 3rd of the facial skeleton; Banks P.

i. Killey's and kays outline of oral surgery Part I; Seward GR et al

j. Oral and maxillofacial surgery Vol 1,2; Laskin DM

k. Extraction of teeth; Howe GL

l. Minor oral surgery; Howe GL

m. Contemporary oral and maxillofacial surgery; Peterson I J. et al

n. Oral and maxillofacial infections; Topazian RG & Goldberg MH

PUBLIC HEALTH DENTISTRY

1. GOALS

a. To prevent and control oral diseases and promote oral health through organized community efforts.
b. To provide critical knowledge and understanding of public health dentistry.
c. To develop students understanding of the major oral health problems of community.
d. 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.
e. To enable students to understand and undertake health services research and to apply key findings into dental public health practice.

2. OBJECTIVES

a. KNOWLEDGE:

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

a) At the conclusion of the course the students shall have require at the skill of identifying health problems affecting the society, conducting health surveys, conducting health education classes and deciding health strategies.
b) Students should develop a positive attitude towards the problems of the society and must take responsibilities in providing health.
c) 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.
d) Plan and perform all necessary treatment, prevention, and promotion of Oral Health at the individual and community level.
e) Plan appropriate Community Oral Health Programme, conduct the programme and evaluate, at the community level.
f) Ability to make use of knowledge of epidemiology to identify causes and plan appropriate preventive and control measures.
g) Develop appropriate person power at various levels and their effective utilization. Conduct survey and use appropriate methods to impart Oral Health Education.
h) Develop ways of helping the community towards easy payment plan, followed by evaluation of their oral health care needs.
i) Develop the planning, implementation, evaluation and administrative skills to carry out successful Community oral Health programmes.

c. ATTITUDE:

i. Adopt ethical principles in all aspects of Community Oral Health activities.
ii. To apply ethical and moral standards while carrying out epidemiological research.
iii. Develop communication skills, in particular to explain the causes and prevention of oral health diseases to the patient.
iv. Be humble and accept the limitations in his knowledge and skill and to ask for help from colleagues

when needed and promote teamwork approach.

v. 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

Syllabus:

TOPIC	MUST KNOW	DESIRABLE TO KNOW	NICE TO KNOW
Introduction to Dentistry	Definition of Dentistry, History of dentistry, Health, Public Health, Dental Public Health, Scope, aims and objectives of Dentistry		
Public Health	Health & Disease:- Concepts, Philosophy, 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 Behavioral 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 organizations.	Ethics and Jurisprudence: Professional liabilities, negligence, malpractice, consents, evidence, Health Education: - Definition, concepts, principles, methods, and health education aids	Contracts and methods of identification in forensic dentistry

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
Newer Topics to be included			Mobile Dental Clinic, Tobacco Cessation, Bioethics, Counseling Skills, Health Legislation

PRACTICALS/CLINICALS/FIELD PROGEAMME IN COMMUNITY DENTISTRY:

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

1. Understand the community aspects of dentistry

2. To take up leadership role in solving community oral health programme

Exercises:

a) Collection of statistical data (demographic) on population in India, birth rates, morbidity and mortality, literacy, per capita income

b) Incidence and prevalence of common oral diseases like dental caries, periodontal disease, oral cancer, fluorosis at national and international levels

c) Preparation of oral health education material posters, models, slides, lectures, play acting skits etc.

d) Oral health status assessment of the community using indices and WHO basic oral health survey methods

e) Exploring and planning setting of private dental clinics in rural, semi urban and urban locations, availment of finances for dental practices-preparing project report.

f) Visit to primary health center-to acquaint with activities and primary health care delivery

g) Visit to water purification plant/public health laboratory/ center for treatment of western and sewage water

h) Visit to schools-to assess the oral health status of school children, emergency treatment and health education including possible preventive care at school (tooth brushing technique demonstration and oral rinse programme etc.)

i) Visit to institution for the care of handicapped, physically, mentally, or medically compromised patients

j) Preventive dentistry: in the department application of pit and fissure sealants, fluoride gel application procedure, A. R. T., Comprehensive health for 5 pts at least 2 patients

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

SUGGESTED INTERNSHIP PROGRAMME IN COMMUNITY DENTISTRY:

I. AT THE COLLEGE:

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

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

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

Graduates posted for at least on month to familiarize in:

(a) Survey methods, analysis and presentation of oral health assessment of school children and community independently using WHO basic oral health survey methods.

(b) Participation in rural oral health education programmes

(c) Stay in the village to understand the problems and life in rural areas

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

Examination Pattern

i. Index: Case History
b) Oral hygiene indices simplified- Green and Vermilion

c) Silness and Loe index for Plaque

d) Loe and Silness index for gingival

e) CPI

f) DMF: T and S, df:t and s

g) Deans fluoride index

II. Health Education

1. Make one - Audio visual aid

2. Make a health talk

III. Practical work

1. Pit and fissure sealant

2. Topical fluoride application

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

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 inter linkages 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