A) GOAL

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

B) OBJECTIVES

a) KNOWLEDGE & UNDERSTANDING:

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

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

b) SKILLS

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

C) INTEGRATION

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

This insight is gained in a variety of ways:

1. Lectures as small group teaching
2. Demonstrations
3. Dissection of the human cadaver
4. Study of dissected specimens
5. Osteology
6. Surface anatomy on living individual
7. Study of radiographs & other modern imaging techniques.
8. Study of Histology slides,
9. Study of embryology models
10. Audio-visual aids

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

D) AN OUTLINE OF THE COURSE CONTENT

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

E) FURTHER DETAILS OF THE COURSE

I. INTRODUCTION TO:

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

I. HEAD & NECK:

01. Scalp, face & temple, lacrimal apparatus 0
03. Cranial cavity - Meninges, parts of brain, ventricles of brain, dural venous sinuses, cranial nerves attached to the brain, pituitary gland.
05. Orbital cavity - Muscles of the eye ball, supports of the eye ball, nerves end vessels in the orbit.
06. Parotid gland.
07. Temporo mandibular joint, muscles of mastication, infratemporal fossa, ptterygo –palatine fossa.
08. Submandibular region
09. Walls of the nasal cavity, paranasal air sinuses
10. Palate
11. Oral cavity, Tongue

II. THORAX: Demonstration on a dissected specimen of

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

V. ABDOMEN: Demonstration on a dissected specimen of

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

V. CLINICAL PROCEDURES :

a) Intramuscular injections: Demonstration on a dissected specimen and on a living person of the following sites of injection.

1. Deltoid muscle and its relation to the axillary nerve and radial nerve.
3. Vastus lateralis muscle.

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

1. Median cubital vein
2. Cephalic vein
3. Basilic vein
4. Long saphenous vein
c) Arterial pulsations: Demonstration of arteries on a dissected specimen and feeling of pulsation of the following arteries on a living person.

1. Superficial temporal
2. Facial
3. Carotid
4. Axillary S, Brachial
6. Radial
7. Ulnar
8. Femoral
9. Popliteal
10. Dorsalis pedis

VI. EMBRYOLOGY:
d) Lumbar puncture: Demonstration on a dissected specimen of the spinal cord, cauda equine & epidural space •and the inter vertebral space between IA & L5 .

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

VII. HISTOLOGY

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

Classification of Glands

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

HUMAN PHYSIOLOGY

A) GOAL
The broad goal of teaching undergraduate students Human Physiology is to provide the student comprehensive knowledge of the normal functions of the organ systems of the body to facilitate an understanding of the physiological basis of health and disease.

B) OBJECTIVES

a) Knowledge

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

1. Explain the normal functioning of all the organ systems and their interactions for well co-ordinated total body function.

2. Assess the relative contribution of each organ system towards the maintenance of the milieu interior.

3. List the physiological principles underlying the pathogenesis and treatment of disease.

b) SKILLS

At the end of the course, the student shall be able to:
1. Conduct experiments designed for the study of physiological phenomena.
2. Interpret experimental and investigative data
3. Distinguish between normal and abnormal data derived as a result of tests which he/she has performed and observed in the laboratory.

c) INTEGRATION

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

B) COURSE CONTENTS THEORY

1. GENERAL PHYSIOLOGY

1. Homeostasis: Basic concept, feedback mechanisms
2. Structure of cell membrane, transport across cell membrane
3. Membrane potentials

2. BLOOD:

Composition & functions of blood
Specific gravity, packed cell volume, factors affecting & methods of determination.
Plasma proteins Types, concentration, functions & variations.
Erythrocytes - Morphology, functions & variations. Erythropoiesis & factors affecting erythropoiesis.
ESR- Methods of estimation, factors affecting, variations & significance.
Haemoglobin - Normal concentration, method of determination & variation in concentration.
Blood Indices - MCV, MCH, MCHC - definition, normal values, variation.
Anaemia - Definition, classification, life span of RBC's destruction of RBC's, formation & fate of bile pigments, Jaundice – types.
Leucocytes: Classification, number, percentage, distribution morphology, properties, functions & variation. Role of lymphocytes in immunity, leucopoiesis life span & fate of leucocytes.
Thrombocytes - Morphology, number, variations, function & thrombopoiesis.
Haemostasis - Role of vasoconstriction, platelet plug formation in haemostasis, coagulation factors, intrinsic & extrinsic pathways of coagulation, clot retraction.
Blood groups: ABO & Rh system, method of determination, importance, indications & dangers of blood transfusion, blood substitutes.
Blood volume: Normal values, variations.
Body fluids: distribution of total body water, intracellular & extracellular compartments, major anions & cations in intra and extra cellular fluid.
Functions of reticulo endotretelial system.

3. MUSCLE AND NERVE

Classification of nerves, structure of skeletal muscle - Molecular mechanism of muscle contraction, neuromuscular

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

5. EXCRETORY SYSTEM:
Structure & functions of kidney, functional unit of kidney & functions of different parts: Juxta glomerular apparatus, renal blood flow.
Formation of Urine: Glomerular Alteration rate - definition, determination, normal values, factors influencing O.P.R. Tubular "re absorption - Re absorption of sodium, glucose, water & other substances. Tubular secretion - secretion of urea, hydrogen and other substances.
Mechanism of concentration & dilution of urine. Role of kidney in the regulation of pH of the blood.
Micturition: anatomy & innervation of Urinary bladder, mechanism of nutrition & abnormalities.

6. BODY TEMPERATURE & FUNCTIONS OF SKIN

7. ENDOCRINOLOGY
Posterior pituitary: Functions, regulation & disorders of secretion.
Thyroid: Histology, synthesis, secretion & transport of hormones, actions of hormones, regulation of secretion & disorders; Thyroid function tests.
Other hormones - Angiotensin, A.N.F

8. REPRODUCTION
lactation, milk ejection, reflex, Male reproductive system: spermatogenesis, semen and contraception.

9. CARDIO VASCULAR SYSTEM

Functional anatomy and innervation of heart Properties of cardiac muscle Origin & propagation of cardiac impulse and heart block.

Electrocardiogram - Normal electrocardiogram. Two changes in ECG in myocardial infarction.

Cardiac Cycle - Phases, Pressure changes in atria, ventricles & aorta.

Volume changes in ventricles. Jugular venous pulse, arterial pulse.

Heart sounds: Mention of murmurs.

Heart rate: Normal value, variation & regulation.

Cardiac output: Definition, normal values, one method of determination, variation, factors affecting heart rate and stroke Volume.


10. RESPIRATORY SYSTEM

Physiology of Respiration: External & internal respiration.

Functional anatomy of respiratory passage & lungs.

Respiratory movements: Muscles of respiration, Mechanism of inflation & deflation of lungs.

Intra pleural & intra pulmonary pressures & their changes during the phases of respiration.

Mechanics of breathing - surfactant, compliance & work of breathing.

Spirometry: Lung volumes & capacities definition, normal values, significance, factors affecting vital capacity, variations in vital capacity, FEV & its variations.

Pulmonary ventilation - alveolar ventilation & dead space – ventilation.

Composition of inspired air, alveolar air and expired air.

Exchange of gases: Diffusing capacity, factors affecting it.

Transport of Oxygen & carbon dioxide in the blood

Regulation of respiration - neural & chemical.

Hypoxia, cyanosis, dyspnoea, periodic breathing.

Artificial respiration, pulmonary function tests.

11. CENTRAL NERVOUS SYSTEM

1. Organization of central nervous system
2. Neuronal organization at spinal cord level
3. Synapse receptors, reflexes, sensations and tracts
4. Physiology of pain
5. Functions of cerebellum, thalamus, hypothalamus and cerebral cortex,
6. Formation and functions of CSF
7. Autonomic nervous system
12. SPECIAL SENSES

Fundamental knowledge of vision, hearing, taste and smell.

PRACTICALS

The following list of practical is minimum and essential. All the practical have been categorized as procedures and demonstrations. The procedures are to be performed by the students during practical classes to acquire skills. All the procedures are to be included in the University practical examination.

Those categorized as demonstrations are to be shown to the students during practical classes. However these demonstrations would not be included in the University examinations but question based on this would be given in the form of charts, graphs and calculations for interpretation by the students.

PROCEDURES

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

DEMONSTRATION

1. Determination of packed cell volume and erythrocyte sedimentation rate
2. Determination of specific gravity of blood
3. Determination of erythrocyte fragility
4. Determination of vital capacity and timed vital capacity
5. Skeletal muscle experiments.
6. Electrocardiography: Demonstration of recording of normal Electro cardiogram
7. Clinical examination of cardiovascular and respiratory system.

BIOCHEMISTRY

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

The chemistry portion should strive towards providing information on the functional groups, hydrophobic and hydrophilic moieties and weak valence forces that organize macro molecules. Details on structure need not be emphasized.

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

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

• Need not know the structure of cholesterol. Should know why it cannot be carried free in plasma.
• Mutarotation should not be taught. Student should know why amylase will not hydrolyse cellulose.

• Need not know the details of alpha - helix and beta - pleats in proteins. Should know why haemoglobin is globular and keratin is fibrous.

• Need not know mechanism of oxidative phosphorylation. Should know more than 90 % of ATP is formed by this process.

• Need not know details of the conversion of pepsinogen to pepsin. Should know hydrochloric acid cannot break a peptide bond at room temperature.

• Need not remember the steps of glycogenesis. Should know that excess intake of carbohydrate will not increase glycogen level in liver or muscle.

• Need not know about urea or creatinine clearance tests. Should know the basis of increase of urea and creatinine in blood in renal insufficiency.

• Need not know the structure of insulin. Should know why insulin level in circulation is normal in most cases of maturity onset diabetes,

• Need not know the structural details of ATP. Should know why about 10 g of ATP in the body at any given time meets all the energy needs.

• Need not know the mechanism of action of prolylhydroxylase. Should know why the gum bleeds in scurvy.

• Need not know the structure of Vitamin K. Should know the basis of internal bleeding arising due to its deficiency

• Need not renumber the structure of HMGCoA. Should know why it does not lead to increased cholesterol synthesis in starvation.

DENTAL ANATOMY, EMBRYOLOGY AND ORAL HISTOLOGY

INTRODUCTION

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

SKILLS

1. The student should acquire basic skills in
2. Carving of crowns of permanent teeth in wax.
3. Microscopic study of oral tissues.
4. Identification of Deciduous & Permanent teeth.
5. Age estimation by patterns of teeth eruption from plaster casts of different age groups.

OBJECTIVES

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

1. The student is expected to appreciate the normal development, morphology, structure & functions of oral tissues & variations in different pathological / non-pathological states.

2. The student should understand the histological basis of various dental treatment procedures and physiologic ageing process in the dental tissues.

3. The students must know the basic knowledge of various research methodologies.

I. TOOTH MORPHOLOGY

1. Introduction to tooth morphology:
2. MORPHOLOGY OF PERMANENT TEETH:

- Description of individual teeth, along with their endodontic anatomy & including a note on their chronology of development, differences between similar class of teeth & identification of individual teeth.

- Variations & Anomalies commonly seen in individual teeth.

3. Morphology of Deciduous teeth:

- Generalized differences between Deciduous & Permanent teeth.

- Description of individual deciduous teeth, including their chronology of development, endodontic anatomy, differences between similar class of teeth & identification of individual teeth.

4. Occlusion:

- Definition, factors influencing occlusion - basal bone, arch, individual teeth, external & internal forces & sequence of eruption.

- Inclination of individual teeth - compensatory curves.

- Centric relation & Centric occlusion - protrusive, retrusive & lateral occlusion.

- Clinical significance of normal occlusion.

- Introduction to ’ & Classification of Malocclusion.

II. ORAL EMBRYOLOGY

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

2. Development of teeth

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

- Applied aspects of disorders in development of teeth.

3. Eruption of deciduous & Permanent teeth

- Mechanisms it tooth eruption, different theories & histology of eruption, formation of dentogingival junction, role of gubernacular cord in eruption of permanent teeth.

- Clinical or Applied aspects of disorders of eruption.

4. Shedding of teeth:

- Factors & mechanisms of shedding of deciduous teeth.

- Complications of shedding.

II. ORAL HISTOLOGY

1. Detailed microscopic study of Enamel, Dentine, Cementum & Pulp tissue. Age changes & Applied aspects (Clinical and forensic significance) of histological considerations – Fluoride applications, transparent dentine, dentine hypersensitivity, reaction of pulp tissue to varying insults to exposed dentine; Pulp calcifications & Hypercementosis.
2. Detailed microscopic study of Periodontal ligament & alveolar bone, age changes, histological changes in periodontal ligament & bone in normal & orthodontic tooth movement, applied aspects of alveolar bone resorption.


4. Salivary Glands:
   • Detailed microscopic study of actin & ductal system.
   • Age changes & clinical considerations.

5. TM Joint:
   • Review of basic anatomical aspects & microscopic study & clinical considerations.

6. Maxillary Sinus:
   • Microscopic study, anatomical variations, functions & clinical relevance of maxillary sinus in dental practice.

7. Processing of Hard & soft tissues for microscopic study:
   • Ground, sections, de calcified sections & routine staining procedures.

8. Basic histochemical staining patterns of oral tissues.

IV. ORAL PHYSIOLOGY

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

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

3. Deglutition
   • Review of the steps in deglutition, swallowing in infants, neural control of deglutition & dysphagia.

4. Calcium, phosphorous & fluoride metabolism:
   • Source, requirements, absorption, distribution, functions & excretion, clinical considerations, hypo & hypercalcemia, hyper & hypo phosphatemia & fluorosis.

5. Theories of Mineralization:
   • Definition, mechanisms, theories & their drawbacks.
   • Applied aspects of physiology of mineralisation, pathological considerations – calculus formation.

6. Physiology of Taste:
   • Innervation of taste buds & taste pathway, physiologic basis of taste sensation, age changes & applied aspects - taste disorders.

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

GENERAL PATHOLOGY

AIM:

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

**OBJECTIVES:**

Enabling the student

1. To demonstrate and analyze pathological changes at macroscopically and microscopically levels and explain their observations in terms of disease processes.

2. To integrate knowledge from the basic sciences, clinical medicine and dentistry, in the study of Pathology.

3. To demonstrate understanding of the capabilities and limitations of morphological pathology in its contribution to medicine, dentistry and biological research.

4. To demonstrate ability to consult resource materials outside lectures, laboratory and tutorial classes.

**COURSE CONTENT**

1. **Introduction to Pathology**
   - Terminologies
   - The cell in health
   - The normal cell structure
   - The cellular functions

2. **Aetiology and Pathogenesis of Disease**
   - Cell Injury
     - Types — Congenital Acquired
     - Mainly Acquired causes of disease (Hypoxic injury, chemical injury, physical injury, immunological injury.

3. **Degenerations**
   - Amyloidosis
   - Fatty change
   - Cloudy swelling
   - Hyaline change, mucoid degeneration

4. **Cell death & Necrosis**
   - Apoptasis
   - Def, causes, features and types of necrosis
   - Gangrene - Dry, wet, gas
   - Pathological Calcifications (Dystrophic and metastatic)

5. **Inflammation**
   - Definition, causes types, and features
     - Acute inflammation
     - The vascular response
     - The cellular response
     - Chemical mediators
     - The inflammatory cells
     - Fate
   - Chronic inflammation
   - Granulomations inflammation

6. **Healing**
   - Regeneration
   - Repair
     - Mechanisms
     - Healing by primary intention
     - Healing by secondary intention
     - Fracture healing
     - Factors influencing healing process
     - Complications.
7. Tbereulosis
• Epidemiology
• Pathogenesis
• Pathological features of Primary and secondary TB
• Complications and Fate

8. Syphilis
• Epidemiology
• Types and stages of syphilis
• Pathological features
• Diagnostic Criterion
• Oral lesions

9. Typhoid
• Epidemiology
  a) Pathogens
• Pathological features
• Diagnostic criterion

10. Thrombosis
• Definition, Pathophysiology
• Formation, complications & Fate of a thrombus

11. Embolism
• Definition
• Types
• Effects

12. Ischemia and Infraction
• Definition, etiology, types
• Infraction of various organs

13. Derangements of body fluids
• Odema — pathogenesis
  a) Different types

14. Disorders of circulation
• Hyperaemia
• Shock

15. Nutritional Disorders
• Common Vitamin Deficiencies

16. Immunological mechanisms in disease
• Humor & cellular immunity
• Hypersensitivity & autoimmunity

17. AIDS and Hepatitis

18. Hypertension
• Definition, classification
• Pathophysiology
• Effects in various organs

19. Diabetes Mellitus
• Def, Classification, Pathogenesis, Pathology in different organs

20. Adaptive disorders of growth
• Atrophy & Hypertrophy, Hyperplasia, Metaplasia and Dysplasia

21. General Aspects of neoplasia
• Definition, terminology, classification
• Differences between benign and malignant neoplasms
• The neoplastic cell
• Metastasis
• Aetiology and pathogenesis of neoplasia, Carcinogenesis
• Tumour biology• Oncogenes and anti-oncogenes
• Diagnosis
• Precancerous lesions
• Common specific tumours, Squamous papilloma & Carcinoma, Basal cell Carcinoma, Adenoma &
• Adenoca, Fibroma & Fibrosarcoma, Lipoma and liposarcoma

B. Systemic Pathology

22. Anaemias
• Iron Deficiency anaemia, Megaloblastic anaemia

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

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

• Lichen planus, Stomatitis, Leukoplakia, Squamous cell Carcinoma, Dental caries, dentigerous cyst, Ameloblastoma

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

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

28. Diseases of Cardiovascular system
• Cardiac failure
• Congenital heart disease - ASD, VSD, PDA
• Fallot's Tetrology
• Infective Endocarditis
• Atherosclerosis
• Ischaemic heart Disease

29. Haemorrhagic Disorders
• Coagulation cascade
• Coagulation disorders
a) Platelet function
b) Platelet disorders.

**Practicals**

1. Urine - Abnormal constituents
   - Sugar, albumin, ketone bodies
2. Urine - Abnormal constituents
   - Blood, bile salts, bile pigments
3. Haemoglobin (Hb) Estimation
4. Total WBC count
5. Differential WBC Count
6. Packed cell volume (PCV,) Erythrocyte Sedimentation Rate (ESR)
7. Bleeding Time & Clotting Time
8. Histopathology
   - Tissue Processing
   - Staining
9. Histopathology slides
   - Acute appendicitis, Granulation tissue, fatty liver
10. Histopathology slides
    - CVC lung, CVC liver, Kidney amyloidosis
11. Histopathology slides
    - Tuberculosis, Actinomycosis, Rhinosporidiosis
12. Histopathology slides
    - Papilloma, Basal cell Ca, Sq cell Ca
13. Histopathology slides
    - Osteosarcoma, Osteoclastorna, fibrosarcoma
14. Histopathology slides
    - Malignant melanoma, Ameloblastoma, Adenoma
15. Histopathology slides
    - Mixed parotid tumour, metastatic
    - Carcinoma Tymph Node

**MICROBIOLOGY**

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

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

OBJECTIVES:

A. KNOWLEDGE AND UNDERSTANDING

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

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

SKILLS:

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

A brief syllabus of Microbiology is given as follows:

A. GENERAL MICROBIOLOGY

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

B. IMMUNOLOGY

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

2. Corynebacterium diphtheriae - mode of spread, important clinical feature, Laboratory diagnosis, Chemotherapy and Active immunisation.
3. Mycobacteria Tuberculosis and Leprosy
4. Clostridium - Gas gangrene, food poisoning and tetanus.
7. Actinomycetes.

D. VIROLOGY

1. Introduction
2. General properties, cultivation, host - virus interaction with special reference to Interferon.
3. Brief account of Laboratory diagnosis, Chemotherapy and immune prophylaxis in general.
4. A few viruses of relevance to dentistry.
   • Herpes Virus
   • Hepatitis B Virus - brief about other types
   • Human Immunodeficiency Virus (HIV)
   • Mumps Virus
   • Brief - Measles and Rubella Virus
5. Bacteriophage - structure and significance

E. MYCOLOGY

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

F. PARASITOLOGY

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

GENERAL SURGERY

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

1. HISTORY OF SURGERY:

The development of surgery, as a speciality over the years, will give the students an opportunity to know the contributions made by various scientists, teachers and investigators. It will also enable the student to understand the relations of various specialities in the practice of modern surgery.

2. GENERAL PRINCIPLES OF SURGERY:

Introduction to various aspects of surgical principles as related to orodental diseases. Classification of, diseases in general. This will help the student to understand the various diseases, and their relevance to routine dental practice.
3. WOUNDS:
Their classification, healing, repair, treatment, medico-legal aspects of accidental wounds and complications of wounds.

4. INFLAMATION:
Of soft and hard tissues. Causes of inflammation, varieties, treatment and sequelae.

5. INFECTIONS:
Acute and chronic abscess skin infections, cellulitis, carbuncle, and erysipelas. Specific infections such as tetanus, gangrene, syphilis, gonorrhoea, tuberculosis, Actinomycosis, Vincent's angina, cancrum oris, Pyaemia, toxemia and Septicaemia.

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

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

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

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

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

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

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

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

14. PRINCIPLES OF OPERATIVE SURGERY:
Principles as applicable to minor surgical procedures including detailed description of asepsis, antiseptics, sterilisation, principles of anaesthesia.

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

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

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

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

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. Diagnose and treat simple restorative work for teeth.

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

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


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

SKILLS
He/she should attain the following skills necessary for practice of dentistry

i) Use medium and high speed hand - pieces to carry out restorative work.

ii) Use and be familiar with endodontic instruments and materials needed for carrying out simple endodontic treatment.

iii) Translate patients aesthetic 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 CDS programme to update knowledge and professional skill from time to time.

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

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

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

Nomenclature of Dentition:
Tooth numbering systems A. D. A. Zsigmondy palmer and P.D.I. systems.

2. Principles Of Cavity Preparation:
Steps and nomenclature of cavity preparation classification of cavities, nomenclature of floors and angles of cavities

3. Dental Caries
Astiology, classification clinical features, morphological features, microscopic features, clinical diagnosis and sequel of dental.

4. Treatment Planning For Operative Dentistry:
Detailed clinical examination radiographic examination, tooth, vitality tests, diagnosis and treatment planning, preparation of the case sheet

5. Gnathological Concepts of Restoration:
Physiology of occlusion, normal occlusion, ideal occlusion, mandibular movements and occlusal analysis. Occlusal rehabilitation and restoration.

6. Armamentarium for Cavity Preparation:
General classification of operative instruments, hand cutting instruments design formula and sharpening of instruments. Rotary cutting instruments dental bur, mechanism of cutting, evaluation of hand piece and speed current concepts of rotary cutting procedures. Sterilisation and maintenance of instruments. Basic instrument tray set up.

7. Control of Operating Filed:
Light source sterilisation field of operation control of moisture, rubber dam in detail, cotton rolls and anti sialogagues.

8. Amalgam Restoration:

9. Pulp Protection:
Liners, varnishes and bases, Zinc phosphate, zinc polycarboxylate, zinc oxide eugenol and glassinomer cements.

10. Anterior Restorations:
Selection of cases, selection of material, step wise procedures for using restorations silicate (theory only) glass ionomers, composites, including sand witch restorations and bevels of the same with anote on status of the dentine bonding agents:

11. Direct Filling Gold Restorations:
Types of, direct filling gold indications and limitations of cohesive gold. Annealing of gold foil cavity preparation and condensation of gold foils.

12. Preventive Measures in Restorative Practice:
Plaque Control, Pit and fissure sealants dietary measures restorative procedures and periodontal health. Contact and contour of teeth and, restorations matrices tooth separation and wedges.

13. Temposrisation or Interim Restoration.


16. Non Carious Destruction of Tooth Structures Diagnosis and Clinical Management

17. Hyper Sensitive Dentine and its Management.

18. Cast Restorations

Indications, contra indications, advantages and disadvantages and materials used for same Class II and Class I cavity preparation for inlays fabrication of wax pattern spurring inverting and casting procedures & casting defects


20. Gingival Tissue Management For Cast Restoration And Impression Procedures


22. Differences between Amalgam and Inlay Cavity preparation with note-on all the types of Bevels used for Cast Restoration.

23. Control of Pain During Operative Procedures.

24. Treatment Planning for Operative Dentistry Detailed Clinical and Radiographic Examination

25. Vitality Tests, Diagnosis and Treatment Planning and Preparation of Case Sheet.

Applied Dental Materials.

1. Biological Considerations.

Evaluation, clinical application and adverse effects of the following materials. Dental cements, Zinc oxide eugenol cements zinc phosphate cements, polyacidmethylmethacrylate glass ionomer cements, silicatecement calcium hydroxides varnishes.

2. Dental amalgam, technical considerations mercury toxicity mercury hygiene.

3. Composite, Dentine bonding agents, chemical and light curing composites

4. Rubber base Imp. Materials

5. Noble 86 non - noble metal alloys

6. Investment and die materials

7. Inlay casting waxes

8. Dental porcelain

9. Aesthetic Dentistry

27. Endodontics: introduction, definition, scope and future of endodontics

28. Clinical diagnostic methods

29. Emergency endodontic procedures

30. Pulpal diseases causes, types and treatment

31. Periapical diseases: acute periapical abscess, acute periodontal abscess phoenix abscess, chronicalveolar abscess granuloma cysts condensing osteitis, external resorption.

32. Vital pulp therapy: indirect and direct pulp capping, pulpotomy, different types and medicaments used.

33. Apexogenisis and apexification or problems of open apex.
34. Rationale of endodontic treatment case selection indication and contraindications for root canal


37. Preparation of root canal space, Determination of working length, cleaning and shaping of root canals, irrigating solution, chemical aids to instrumentation.


40. Methods of cleaning and shaping like step-back crown down and conventional methods.


43. Post endodontic restoration fabrication and components of post core preparation.

44. Smear layer and its importance in endodontics and conservative treatment.

45. Discoloured teeth and its management, bleaching agents, vital and non-vital bleaching methods.

46. Traumatised teeth classification of fractured teeth, management of fractured tooth and root, Luxated teeth and its management.

47. Endodontic surgeries indication and contraindications, pre operative preparation. Pre medication surgical instruments and techniques apicectomy, retrograde filling, post operative sequale trephination hemisection, radisection techniques of tooth reimplantation (both intentional and accidental) endodontic implants.

48. Root resorption.

49. Emergency endodontic procedures.

50. Lasers in conservative endodontics (introduction only) practice management.


52. Duties towards the govt. like payments of professional tax, income tax.

53. Financial management of practice.

54. Dental material and basic equipment management.

55. Ethics.

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**ORAL PATHOLOGY & ORAL MICROBIOLOGY**

**OBJECTIVES:**

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

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

**SKILLS**

1. Microscopic study of common lesions affecting oral tissues through microscopic slides & projection slides.
2. Study of the disease process by surgical specimens.
3. Study of teeth anomalies / polymorphisms through tooth specimens & plaster casts.
5. Study of haematological preparations (blood films) of anaemias & leukemias.
6. Basic exercises in Forensic Odontology such as histological methods of age estimation and appearance of teeth in injuries.

1. **INTRODUCTION:**

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

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

* Introduction to developmental disturbances - Hereditary, Familial mutation, "Hormonal etc. causesto be highlighted.

* Developmental disturbances of teeth - Aetio-pathogenesis, clinical features, radiological features & histopathological features as appropriate:- The size, shape, number, structure & eruption of teeth & clinical significance of the anomalies to be emphasised.

* Forensic Odontology

* Developmental disturbances of jaws - size & shapes of the jaws.

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

3. Dental Caries:

* Aetio-pathogenesis, microbiology, clinical features, diagnosis, histopathology, immunology, prevention of dental caries & its sequelae

4. Pulp & Periapical Pathology & Osteomyelitis.

* Aetio-pathogenesis & interrelationship, clinical features, microbiology, histopathology & radiological features (as appropriate) of pulp & periapical lesions & osteomyelitis.

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

5. Periodontal Diseases:

* Aetio-pathogenesis, microbiology, clinical features, histopathology & radiological features (as appropriate) of gingivitis, gingival enlargements & periodontitis, Basic immunological mechanisms of periodontal disease to be highlighted

6. Microbial infections of oral soft tissues:

* Microbiology, defence mechanisms including immunological aspects, oral manifestations, histopathology and laboratory diagnosis of common bacterial, viral & fungal infections namely:

Bacterial : Tuberculosis, Syphilis, ANUG & its complications - Cancrun Oris.
Viral: Herpes Simplex, Varicella Zoster, Measles, Mumps & HIV infection.

Fungal: Candidal infection, Aphthous Ulcers.

7. Common non-inflammatory diseases involving the jaws:

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

8. Diseases of TM Joint:

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

9. Cysts of the Oral & Paraoral region:

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


13. ORAL MEDICINE AND RADIOLOGY.

AIM:

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

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

(3) The principles of the clinical and radiographics aspects of Forensic Odontology. The syllabus in ORAL MEDICINE & RADIOLOGY is divided into two main parts.


Again the part ONE is subdivided into three sections.

(A) Diagnostic methods
(B) Diagnosis and differential diagnosis
(C) Oral Medicine & Therapeutics.

COURSE CONTENT

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

Part - I ORAL MEDICINE AND DIAGNOSTIC AIDS

SECTION (A) - DIAGNOSTIC METHODS

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

SECTION (B) - DIAGNOSIS, DIFFERENTIAL DIAGNOSIS

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

(1) Teeth : Developmental abnormalities, causes of destruction of teeth and their sequelae and discolouration of teeth.

Metabolic disorders – Histicylosis
Endocrine - Acro-megaly and hyperparathyroidism
Miscellaneous - Paget's disease, Mano and polyostotic fibrous dysplasis, Cherubism.

(3) Temporomandibular Joint: Developmental abnormalities of the condyle, Rheumatoid arthritis, Osteoarthritis, Sub-luxation and luxation.

(4) Common cysts and Tumors:
Cysts of soft tissue: Mucocele and Ranula.
Cysts of bone: Odontogenic and nonodontogenic

TUMORS

Soft Tissue:
Epithelial: Papilloma, Caroinoma, Melanoma
Connective tissue : Fibroma, Lipoma, Fibroarcoma
Vascular : Haemangioma, Lymphangioma

15. PAEDIATRIC & PREVENTIVE DENTISTRY THEORY:

THEORY

1. INTRODUCTION TO PERIODONTICS & PREVENTIVE DENTISTRY.
   - Definition, Scope, Objectives and Importance.

2. GROWTH & DEVELOPMENT:
   - Importance of study of growth and development in Periodontics.
   - Prenatal and Postnatal factors in growth & development.
   - Theories of growth & development.
   - Development of maxilla and mandible and related age changes.

3. DEVELOPMENT OF OCCLUSION FROM BIRTH THROUGH ADOLESCENCE
   - Study of variations and abnormalities.

4. DENTAL ANATOMY AND HISTOLOGY:
   - Development of teeth and associated structures.
   - Eruption and shedding of teeth.
   - Teething disorders and their management.
   - Chronology of eruption of teeth.
   - Differences between deciduous and permanent teeth.
   - Development of dentition from birth to adolescence.
- Importance of first permanent molar.

5. DENTAL RADIOLOGY RELATED TO PERIODONTICS.

6. ORAL SURGICAL PROCEDURES IN CHILDREN.
- Indications and contraindications of extractions of primary and permanent teeth in children.
- Knowledge of Local and General Anaesthesia.
- Minor surgical procedures in children

7. DENTAL CARIES:
- Historical background.
- Definition, aetiology & pathogenesis.
- Caries pattern in primary, young permanent and permanent teeth in children.
- Rampant caries, early childhood caries and extensive caries:
  * Definition, aetiology, Pathogenesis, Clinical features, Complications & Management.
- Role of diet and nutrition in Dental Caries.
- Dietary Modifications & Diet counselling.
- Caries activity, tests, caries prediction, caries susceptibility & their clinical application.

8. GINGIVAL & PERIODONTAL DISEASES IN CHILDREN.
- Normal gingiva & periodontium in children.
- Definition, aetiology & Pathogenesis.
- Prevention & Management of gingival & Periodontal diseases.

9. CHILD PHYSIOLOGY:
- Definition.
- Theories of child psychology.
- Psychological development of children with age.
- Principles of psychological growth & development while managing child patient.
- Dental fear and its management.
- Factors affecting child's reaction to dental treatment.

10. BEHAVIOUR MANAGEMENT:
- Definitions.
- Types of behaviour encountered in the dental clinic.
- Non-pharmaceutical & pharmacological methods of Behaviour Management.

11. PAEDIATRIC OPERATIVE DENTISTRY:
- Principles of Paediatric Operative Dentistry.
- Modifications required for cavity preparation in primary and young permanent teeth.
- Various Isolation Techniques.
- Restorations of decayed primary, young permanent and permanent teeth in children using various restorative materials like Glass Ionomer, Composites & Silver Amalgam, Stainless Steel, Polycarbonate & Resin Crowns.

12. PAEDIATRIC ENDODONTICS
- Principles & Diagnosis.
- Classification of Pulpal Pathology in primary, young permanent & permanent teeth

14. ORTHODONTICS & DENTAL ORTHOPAEDICS

COURSE OBJECTIVE:
Undergraduate programme in Orthodontics is designed to enable the qualifying dental surgeon to diagnose, analyse and treat common orthodontic problems by preventive, interceptive and corrective orthodontic procedures. The following basic instructional procedures will be adapted to achieve the above objectives.
1. Introduction, Definition, Historical Background, Aims and Objectives of Orthodontics and Need for Orthodontic care.

2. Growth and Development: In General
   a. Definition.
   b. Growth spurts and Differential growth.
   c. Factors influencing growth and Development.
   d. Methods of measuring growth
   e. Growth theories (Genetic, Sicher's Scott's, Moss's Petrovics, Multifactorial)
   f. Genetic and epigenetic factors in growth
   g. Cephalocaudal gradient in growth.

   b. Prenatal growth of craniofacial structures.
   c. Postnatal growth and development of: cranial base, maxilla, mandible, dental arches and occlusion.

4. Functional Development of Dental Arches and Occlusion.
   b. Forces of occlusion.
   c. Wolfe's law of transformation of bone
   d. Trajectories of forces.

5. Clinical Application of Growth and Development

6. Malocclusion - In General
   a. Concept of normal occlusion.
   b. Definition of malocclusion.
   c. Description of different types of dental, skeletal and functional malocclusion.


8. Aetiology of Malocclusion.
   a. Definition, Importance, classification, local and general aetiological factors.
   b. Etiology of following different types of Malocclusion:
      1) Midline diastema
      2) Spacing
      3) Crowding
      4) Cross-Bite: Anterior / Posterior
      5) Class III Malocclusion
      6) Class II Malocclusion
      7) Deep Bite.
      8) Open Bite.

9. Diagnosis And Diagnostic Aids
   a. Definition, Importance and classification of diagnostic aids.
   b. Importance of case history and clinical examination in orthodontics
   c. Study Models: - Importance and uses - Preparation and preservation of study models.
   d. Importance of Introral X-rays in orthodontics.
   e. Panoramic radiographs: - Principles, Advantages, disadvantages and uses.
   f. Cephalometrics: Its advantages, disadvantages
1. General Principles in Orthodontic Treatment Planning of Dental and Skeletal Structures

17. PERIODONTOLOGY

OBJECTIVES:

The student shall acquire the skill to perform dental scaling, diagnostic tests of periodontal diseases; to use the instruments for periodontal therapy and maintenance of the same. The student shall develop attitude to impart the preventive measures namely, the prevention of periodontal diseases and prevention of the progress of the disease. The student shall also develop attitude to perform the treatment with full aseptic precautions; shall develop an attitude to prevent iatrogenic diseases; to conserve the tooth to the maximum possible time by maintaining periodontal health and to refer the patients who require specialist's care.

1. Introduction: Definition of Periodontology, periodontics, Periodontal, Brief historical background, scope of periodontics.
2. Development of periodontal gingiva, Junctional epithelium in details, Epithelial-Mesenchymal interaction, periodontal ligament, cementum, alveolar bone.
3. Defensive mechanisms in the oral cavity: Role of epithelium, gingival fluid, saliva and other defensive mechanisms in the oral environment.
4. Age changes in periodontal structures and their significance in Geriatric dentistry - Age changes in teeth and periodontal structures and their association with periodontal diseases.

* Plaque associated, ANUG, steroid hormone influence, Medication influenced, Desquamative gingivitis, other forms of gingivitis as in nutritional deficiency, bacterial and viral infections etc.

* Periodontitis: Adult periodontitis, Rapidly progressive periodontitis A&B, Juvenile periodontitis (localised, generalised and post-juvenile), Prepubertal periodontitis, Refractory periodontitis.

6. Gingival Diseases - Localised and generalised gingivitis, Papillary, Marginal and diffuse gingivitis Aetiology, pathogenesis, clinical signs, symptoms and management of
   (i) Plaque associated gingivitis.
   (ii) Systemically aggravated gingivitis (sex hormones, drugs and systemic diseases).
   (iii) ANUG
   (IV) Desquamative gingivitis - Gingivitis associated with lichen planus, pemphigoid, pemphigus, and other vesiculobullous lesions.
   (v) Allergic gingivitis.
   (vi) Infective gingivitis - Herpetic, bacterial and candidial
   (vii) Pericoronitis.
   (viii) Gingival enlargement (classification and differential diagnosis).

7. Epidemiology of periodontal diseases.
   - Definition of index, incidence, prevalence, epidemiology, endemic, epidemic and pandemic
   - Classification of indices (Irreversible and reversible).
   - Deficiencies of earlier indices used in periodontics.
   - Detailed understanding of Silness & Loe Plaque Index, Loe

* Silness Gingival Index, CPITN & CPI - Prevalence of periodontal diseases in India and other countries.
* Public health significance all these topics are covered at Epidemiology of periodontal diseases.

18. PROSTHODONTICS AND CROWN & BRIDGE.
Complete Dentures.

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

B. Communicating with the patient
1. Understanding the patients.
   * Mental Attitude.
2. Instructing the patient.

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

D. Articulators - discussion.

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

F. Principles of Retention, Support and Stability

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

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

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

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

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

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

M. Relating inclination of teeth to concept of occlusion in brief.
   a) Neutrocentric concept.

11. CONSERVATIVE DENTISTRY AND ENDODONTICS

OBJECTIVES :

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

A). Knowledge and understanding:
The graduate should acquire the following knowledge during the period of training.
   i. Diagnose and treat simple restorative work for teeth.
   ii. Gain knowledge about aesthetic restorative material and to translate the same to patients needs.
   iii. Gain the knowledge about endodontic treatment on the basis of scientific foundation.
   v. Carry out simple luxation of tooth and its treatment and to provide emergency endodontic treatment.

SKILLS

He / she should attain the following skills necessary to practice of dentistry.
   i) Use medium and high speed hand - pieces to carry out restorative work.
   ii) Use and be familiar and with endodontic instruments and materials needed for carrying out simple endodontic treatment.
   iii) Translate patients aesthetic needs along with function.

ATTITUDES:

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

INTRODUCTION :

Definition aims objectives of Conservation Dentistry Scope and future of Conservation Dentist.


4. Treatment Planning For Operative Dentistry:Detailed Clinical examination, radiographic examination, tooth vitality
tests, diagnosis and treatment planning, preparation of the case sheet.

5. Gnathological Concepts of Restoration:
Physiology of occlusion, normal occlusion, ideal occlusion, mandibular movements and occlusal analysis, Occlusal rehabilitation and restoration.

6. Armamentarium for Cavity Preparation:
General classification of operative instruments, hand cutting instruments design formula and sharpening of instruments. Rotary cutty 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 sterilisation field of oepration control of moisture, rubber dam in detail, cotton rollsand anti sialogues.

8. Amalgam Restoration:

12. ORAL & MACILLOFACIAL SURGERY

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

OBJECTIVES
a) Knowledge of Understanding:
At the end of the course and clinical training the graduate to expected to -
1. Apply the knowledge gained in the related medical subjects like pathology, microbiology and general medicine in the management of patients with oral surgical problems.
2. Diagnose, manage and treat (understand the principles of treatment of) patients with oral surgical problems.
3. Gain knowledge of a range of surgical treatments.
4. Be able to decide the requirement of a patient to have oral surgical specialist opinion or treatment.
5. Understand the principles of in-patient management.
6. Understand the management of major oral surgical procedures and principles involved in patient management.
7. Know the ethical issues and have communication ability.

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

DETAILED SYLLABUS.
1. Introduction, Definition, scope, aims and objectives.
2. Diagnosis in oral surgery:
   (A) History taking.

4. Principles of Oral Surgery -

a) Asepsis: Definition, measures to prevent introduction of Infection during surgery.  
   1. Preparation of the patient. 
   2. Measures to be taken by operator. 
   3. Sterilisation of instruments - various methods of sterilisation etc. 
   4. Surgery set up.

b) Painless Surgery:
   1. Pre-anaesthetic considerations. Pre-medication: purpose, drugs used 
   2. Anaesthetic considerations - 
      a) Local b) Local with IV Sections 
   3. Use of general anaesthetic.

   Use of Burs: Advantages & precautions. 
   Bone cutting instruments: Principles of using chisel & osteotome.

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16. PUBLIC HEALTH DENTISTRY

GOAL:

To prevent and control oral diseases and promote oral health through organised community efforts.

OBJECTIVES:

Knowledge:
At the conclusion of the course the student shall have a knowledge of the basis of public health, preventive dentistry, public health problems in India, Nutrition, Environment and their role in health, basics of dental statistics, epidemiological methods, National Oral Health Policy.

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

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

Syllabus:

1. Introduction to Dentistry: Definition of Dentistry, History of dentistry, Scope, aims and objectives of Dentistry.
2. Public Health:
   i. Health & Disease:- Concepts, Philosophy, Definition and Characteristics 
   ii. General Epidemiology:- Definition, Objectives, methods 
   iii. Environmental Health:- Concepts, principles, protection, sources, purification environmental sanitation of water, disposal of waste, sanitation, then role in mass disorder. 
   iv. Health Education L- Definition, concepts, principles, methods, and health education aids. 
   vi. Public Health Administration:- Priority, establishment, manpower, private practice management, hospital management. 
   ix. Behavioural science: Definition of sociology, anthropology and psychology and their relevance in dental practice.
Dental Public Health:

1. Definition and difference between community and clinical health.
2. Epidemiology of dental diseases-dental caries, periodontal diseases, malocclusion, dental fluorosis and oral cancer.
4. Delivery of dental care: Dental auxiliaries, operational and non-operational, incremental and comprehensive health care, school dental health.
5. Payments of dental care: Methods of payments and dental insurance, government plans.
6. Preventive Dentistry - Definition, Levels, role of individual, community and profession, fluorides in dentistry, plaque control programmes.

Research Methodology and Dental Statistics

2. Research Methodology:- Definition, types of research, designing a written protocol.