



## Medical Practitioners and Dentists Board



# Bachelor of Dental Surgery Core Curriculum



# **Bachelor of Dental Surgery**

## Core Curriculum

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## Foreword

Globalization, population growth and migration have made the world a global village in which emerging and re-emerging diseases are having an impact on morbidity and mortality. The dental practitioners must therefore have vast knowledge of conditions that are prevalent all over the world along with their management approaches, in order to ensure effective service delivery to citizens.

It is to be noted that the Bachelor of Dental Surgery (BDS) curriculum in Kenya was last reviewed in July 1999. Nevertheless, there have been significant changes over the years in terms of disease pattern, management approaches as well as in terms of information technology. It is in view of these dynamics that the Medical Practitioners and Dentists Board (MPDB) found it necessary to review the existing BDS Core Curriculum in order to harmonize the training of dentists while also addressing gaps in both the training and the practice.

The curriculum proposals herein provide the fundamental content that must be covered by all dental practitioners during their undergraduate training programme. Besides the specialized areas, the curriculum also covers Leadership, Management and Governance in Health Systems as well as in Mental Health, which are deemed to be important areas for dentists to be conversant with.

The curriculum is presented in two sections, with section 1 devoted to a description of the programme while chapter two delves into more detailed course descriptions and their respective weightings. All dental schools in the country are expected to review their curricula to ensure that they are in line with the guidelines provided in this core curricula publication. Moreover, it is emphasised that this revised BDS curriculum therefore supersedes any other previous curriculum publications and is effective from 1<sup>st</sup> July 2013.



**PROF. GEORGE A. O. MAGOHA, EBS. MBS**  
**Chairman, Medical Practitioners and Dentists Board**

## Preface

The Medical Practitioners and Dentists Act (Cap 253, Laws of Kenya) gives the Board the responsibility of ensuring that dental graduates acquire the desired knowledge and skills necessary for the delivery of clinical services.

Due to the anticipated increase in dental schools in the region, there is need to have a standardized curriculum for training in dentistry. It is hoped that at the end of the course, the trainee should be able to accept a wide scope of responsibilities in prevention, diagnosis and treatment of common diseases. The trainee will eventually be expected to undergo internship training before entering independent practice.

The reviewed core curriculum in dentistry has addressed pertinent issues that current and upcoming training institutions have for long desired to have tackled. The core curriculum will ensure the incorporation of progressive and improved methods of study to the dynamic field of dentistry.

The curriculum therefore, is the yardstick and blue print to be followed by all dental schools in Kenya in the training of dental practitioners.



**DR. FRANCIS M. KIMANI**  
**Director of Medical Services/Registrar**  
**Medical Practitioners and Dentists Board**



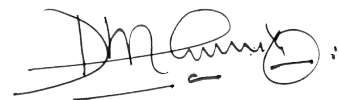
## Acknowledgements

The Medical Practitioners and Dentists Board (MPDB) wishes to express gratitude to all those who contributed to the review of the core curriculum in dentistry. Special thanks goes to Prof. George A. O. Magoha (Chairman MPDB) and the entire membership of the Board for providing the required leadership that led to the very review process; the Chair Education and Specialist Recognition Committee Prof. Barasa O. Khwa-Otsyula and other members, Prof. Zipporah Ngumi; Dr. Tom Ochola and Dr. Mahendra Pancholi, all for their foresight, hard work and dedication which resulted in the successful completion of this curricula document. In addition we also give special thanks to the Editorial Board comprising Dr. Tom Ochola, Prof. Otsyula, Dr. Wambeti Njiru and Dr. Tonnie Mulli for their effort in refining the document.

We also acknowledge the contribution of the Commission for University Education (CUE) through Mr. Samuel Kachumbo for providing the necessary guidelines that were used to standardize the core curricula, as well as the under-mentioned Deans for sharing their experiences and that of their teaching institutions: Dr. Daniel Ojuka (University of Nairobi, School of Medicine); Dr. Bernard Muua (University of Nairobi, Dental School); Dr. Claudio Owino (Moi University School of Medicine); Dr. Caroline Kibosia, (Moi University, Dental School); Dr. Kennedy Ndede (Kenya Methodist University); Dr. Reuben Thuo (Jomo Kenyatta University of Agriculture and Technology); Dr. Pamela Tsimbiri (Egerton University); Dr. John Tole, AgaKhan University Hospital) and Dr. Okello Agina (Kenyatta University).

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Finally, we record the Board's gratitude to the following MPDB staff members for the exemplary secretarial and logistical support that was accorded to the review process: Rose Wafukho, Christine Muriu, Beverly Cheptoo and Sarah Were.



**DANIEL M. YUMBYA**  
**Chief Executive Officer**  
**Medical Practitioners and Dentists Board**

## List of Abbreviations

BDS	Bachelor of Dental Surgery
CDC	Centre for Disease Control
CMOH	County Medical Officer of Health
K.C.S.E	Kenya Certificate of Secondary Education
MBChB	Bachelor of Medicine and Bachelor of Surgery
MO	Medical Officer
MPDB	Medical Practitioners and Dentist Board
PPB	Pharmacy and Poisons Board
WHO	World Health Organization
USAID	United States Agency for International Development

# Section 1

## General Programme Description

### 1.0 Introduction

It is expected that in Kenya, as in other parts of the world, the number of Dental Schools will increase to address the growing demand for training of dental practitioners. Against this background and in line with current international trends it is imperative to a system that will ensure that trainees get minimum Knowledge and skills required for efficient practice of medicine.

The core curriculum outlines the minimum requirements in any dental school must cover. However, the Board recognizes that most dental schools will exceed the minimum recommendations in many respects. Indeed, the schools are encouraged to add content to enrich their curriculum and adapt methods of teaching or delivery that will help trainees cope in a highly dynamic professional field. It is for this reason that 10 (ten) units have been left to respective dental schools to decide what content they want to cover over and above the recommended core curriculum.

At the end of the course, the doctor should be able to practice safely and effectively as an intern and have a foundation for further training in various branches of dentistry.

## 1.1 Course Structure

### **a. Course duration**

- i) The programme should extend over a period of not less than five (5) years.
- ii) An academic year could either be divided into semesters or terms.
- iii) No student should spend more than double the prescribed duration on the course.

### **b. Units/credit system**

- A unit course is defined as fifteen (15) hours of lectures, or thirty (30) hours of tutorials or forty five (45) hours of practical/clinical teaching.
- One (1) unit of dental core courses is equivalent to one (1) week of teaching. The end of year examination period should cover at least two (2) weeks.
- The programme should be weighted as one hundred and eighty one (181) units in five (5) years.

## 1.2 Admission Requirements/Criteria

All candidates admitted to the degree programme must satisfy the following requirements:

- a) Satisfy the common requirements for entry into the university;
- b) Meet the requirements for the various courses which depend on the following subject cluster:
  - Biology
  - Chemistry
  - Physics or Mathematics
  - English or Kiswahili.

- i. **K.C.S.E. holders:** The applicant should have the prevailing minimum university admission requirement. Additionally, a B plain in each of the four (4) cluster subjects shown in (b) above.
- ii. **Advanced Level Holders:** A minimum of two (2) principal passes; in biology, chemistry, and a subsidiary pass in either mathematics or physics.
- iii. **International Baccalaureate (IB):** Grade 5 and above in the cluster subjects in (b) above.
- iv. **Diploma in Medical Sciences**  
The applicant should have a three-year diploma from a medical training institution recognized by the KMPD in any of the following disciplines:
  - Dental Technology,
  - Dental Surgery Assistant,
  - Dental Hygiene,
  - Community Oral Health,
  - Clinical Medicine,
  - Laboratory Technology,
  - Radiography,
  - Pharmaceutical technology,
  - Nursing,
  - Other equivalent disciplines.

In addition, they must have attained a minimum "O" level Division II pass (E.A.C.E.) or, C+ (plus) mean grade and credit pass C+ (Plus) in the cluster subjects in K.C.S.E.

- i. **Degrees in Biological Sciences:** Holders of any degree in biological sciences or equivalent qualifications from a recognized university, subject to passing Graduate Record Examination (GRE).
- ii. **Other Qualifications:** Holders of other qualifications deemed to be equivalent to (i-iv) above from institutions recognized by the different institutional senates may also be admitted.
- iii. **Proficiency in the English language:** International students from non-English speaking countries shall provide evidence of competence in the English language by producing Test of English as a Foreign Language (TOEFL) certificate or its equivalent.

## 1.3 Curriculum Design

Every Dental School must have a written curriculum indicating programme outcomes, curriculum models and mode of delivery employed. The curriculum should be based on sound learning principles that encourage students to be responsible for their learning process and prepare them for lifelong self-directed learning. It should aim at integrating basic and clinical sciences, reducing the factual burden (the need of memorization) on students and fostering ability to participate in the scientific development of dentistry.

## 1.4 Learning/Instructional Methods

Each dental school must define the its instructional methods that encompass diverse teaching and learning approaches including any of the following:

- i. Lectures/Overviews;
- ii. Tutorials and Seminars;
- iii. Practical classes/ Skills laboratories;
- iv. Clinical demonstrations;
- v. Clinical Teaching: Includes bedside teaching, ward rounds, ambulatory care teaching,
- vi. Operating theatre experiences, emergency and critical care;
- vii. Post-mortem demonstrations;
- viii. Laboratory practicals;
- ix. Fieldwork and community based learning;
- x. Self-directed learning; and
- xi. eLearning complementary.

## 1.5 Modes of Assessment

The mode of Assessments should employ both formative and summative methods with emphasis on clinical aspects that encourage problem solving skills as far as possible.

**a. Continuous Assessment (Formative)**

- i) Log of experiences and procedures done
- ii) Case reports and portfolios
- ii) Project reports
- iv) Regular course examinations: written, practicals, clinical and viva voce
- v) Attitudinal assessment

**b. University End of Year Examinations (Summative)**

- i) Written
- ii) Clinical
- iii) Practical
- iv) Viva voce

**c. Examination Regulations**

- i) Certification will be a Bachelor of Dental Surgery (BDS) degree;
- ii) Distribution of marks will be specified by individual institutions. However, continuous assessment should cover at least thirty per cent (30%) of the final mark;
- iii) The pass mark for each subject should be fifty per cent (50%);
- v) For clinical courses, a student must pass the clinical component of the examination in order to pass the course;
- vi) BDS Degree is not classified.

**d. Grading**

- 75 -100% A (Distinction)
- 65- 74% B (Credit)
- 50 - 64% C (pass)
- 0-49%: F (Fail)

## 1.6 Credit Transfers

- i. Credit transfer will depend on the curriculum model or design between the institutions where the credit transfer will take place.
- ii. Credits from the clinical disciplines are not transferable.

- iii. Students seeking the transfer must have satisfied the requirements and passed all the relevant courses, with the results reflected in an official transcript.
- iv. The student should present a letter from the dean from their previous institution.
- v. The students seeking transfers should have taken the course not more than three years prior to their seeking of credit transfer
- vi. Transfer of credits will be subjected to the availability of space in the institution.
- vii. The Medical Practitioners and Dentists Board shall be concurrently notified of the credit transfers.

## 1.7 Students with Medical Problems

In special circumstances, a student shall be discontinued on medical grounds if medically unfit to qualify as a dental practitioner and Medical Practitioners and Dentists Board shall be notified.

## 1.8 Course Description Elements

Each course description should have the following elements:

1. Course weighting
2. Course purpose
3. Course outcomes
4. Course content.



## Section 2

# Course Descriptions and Weightings

*Table 1:* Summary table of courses and their weightings

Course	Units
Medical Biochemistry	7
Medical Physiology	7
Human Anatomy	8
Oral Biology	7
General Human Pathology	9
Pharmacology and Therapeutics	5
General Medicine	5
Principles of General Surgery	5
Periodontology and Periodontics	10
Oral Medicine	3
Oral Pathology	5
Oral and maxillofacial Surgery	10
Oral-maxillofacial Radiology and Imaging	5
Oro-facial pain and anxiety management	8
Paediatric Dentistry	7
Orthodontics	7
Dental Biomaterials	6
Restorative Dentistry and Fixed Prosthodontics	16
Prosthetic Dentistry and Dental Technology	16
Dental Public Health and Research Methods	12
Leadership and Management	3
Basic Life Support and Medical Emergencies	2
Common Undergraduate Courses	10
Dental Electives	8
<b>TOTAL</b>	<b>181</b>

## 2.1 Medical Biochemistry (7 Units)

### 1. Course Purpose

To equip the student with knowledge of the chemical composition and processes of the normal human body and their regulation.

### 2. Course Outcomes

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

- a) Describe the basic structure and functions of human biomolecules
- b) Outline the principles of the human metabolic processes

### 3. Course Content

#### **Basic Chemistry**

- Physical Chemistry: Water, solutions and colloids; Ion producing substances; water, acids, bases and salts; Acidity: detection, control, and measurement; Kinetic theory and chemical reactions; the periodic table and electrovalent bond formation. Concept of oxidation and reduction processes
- Organic Chemistry: The International Union of Pure and Applied Chemistry (IUPAC) nomenclature. Classification of organic compounds. Organic structure representation; structural diagrams, condensed formulas, bond line notation, Newman projection, Fischer projections, Haworth projection, stereo projection. Electrophiles, nucleophiles and their reactions. Nomenclature, structures. Physical and chemical properties and reactions of alkanes, alkyl halides, alkanes, alkynes, alcohols, aldehydes and ketones, ethers, esters. Covalent bond formation and molecular orbitals. Hydrogen, dative, hydrophilic and hydrophobic bonds. Carboxylic acids and amines. Aldol condensation and Claisen reactions.

#### **Biomolecules**

- Classification, function and structural formulas of amino acids, lipids, nucleic acids, carbohydrates. Peptide bond formation, protein structure and methods of separation
- Enzymes: classification, catalysis, inhibition, kinetics and units of measuring activity, covalent modification, role of cofactors and zymogen activation. Clinical enzymology
- Vitamins: Classification, structural formulas, mechanisms of action and assay methods hyper- and hypo- vitaminoses

- Neurotransmitters: Classification, synthesis, storage, transport and metabolism of neurotransmitters and other neurochemicals
- Hormones: synthesis, storage, release, transport, mode of action and degeneration of peptide, steroid, amino acid derived hormones and prostaglandins

### ***Intermediary metabolism***

- Standard free energy change of a chemical reaction. Exogenic and endogenic reactions. ATP, NADPH and other high energy compounds
- Carbohydrate metabolism; glycolysis, tricarboxylic acid cycle, anaplerotic reactions and glyoxylate cycle, electron transport chain, oxidative phosphorylation, mitochondria shuttle system, gluconeogenesis, phosphogluconate pathway. Glycogen synthesis and glycogenolysis
- Lipid metabolism; fatty acid biosynthesis, beta-oxidation, ketone bodies synthesis and utilization. Cholesterol triacylglycerol synthesis and mobilization. Lipid digestion.
- Fate of amino acid carbon skeletons and urea synthesis; Special derivatives of amino acids; Special metabolism; Purine and Pyrimidine metabolism; Haem metabolism
- Disorders of metabolism
- Tissue metabolism: Differential metabolism in Liver, Muscle, Adipose, Brain and erythrocytes Integration of metabolism
- Steroid metabolism

### ***Cell Biology, molecular biology and genetics***

- Cell biology: Cell membranes, organelles, functions and disorders. Cell cycle, its regulation and disorders
- Molecular biology: DNA and RNA structure, replication and consensus sequences. DNA recombination and repair. Mutagens and their effect on DNA and suppressor mutations. Polymerase chain reaction and its application. Transcription and translation. Post-translation modification of proteins. Protein targeting in the cell. Control of gene expression
- Molecular genetics: Organization of the human genome, structure of the human chromosomes and karyotypes. Satellite DNA and DNA families. C value of genome Cot Yz values of DNA and its relation to repetition. Gene structure, organization, and gene family. Nuclear and mitochondrial chromosomes,

karyotypes. Mendelian laws of inheritance, Inheritance disorders and genetic diseases

### ***Bio-chemical techniques***

- Introduction to basic bio-informatics and biotechnology
- Carbohydrates, protein and lipid isolation and identification

## **2.2 Medical Physiology (7 Units)**

### **1. Course Purpose**

To enable the student understand the normal functioning of the human body.

### **2. Course Outcomes**

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

- a) Explain physiological concepts and processes.
- b) Explain the organization and functions of body tissues, organs and systems.

### **3. Course Content**

#### ***Physiological Concepts and Processes***

- Introduction to physiological concepts: Descriptive terms and units. Properties of physiological solutions; Concept of homeostasis and normal physiology. Cell structure and function; cell physiology and human genetics. Body fluids and compartments; Intravascular and extravascular compartments. Interstitial fluid composition, function and disorders. Functional organization of the body. Variability, homeodynamism and homeostasis. Human genetics: Nucleic acids; Chromosomes, genes, and gene expression; Genetic basis of inheritance; Genetic code; Alleles and genetic polymorphism; Sex-linked genes
- Physiological processes: Cellular communications, Membrane receptor physiology and ligand signalling; Electrical, endocrine, exocrine, autocrine and paracrine communications; Second messengers and amplification cascades; Exchange of materials across cell membranes

#### ***Body Tissues***

- Nervous tissue: Neuronal types, structure and function, Membrane potentials, Bernstein's theory, Donan-Gibbs equilibrium, Nernst equation and the Goldman

constant field equation. Action potential: generation and propagation; subthreshold potentials; Peripheral nerve classification and properties, axoplasmic transport, nerve injury, degeneration and regeneration. Nerve growth factors. The synapse: types, functional organization; Neurotransmission, neurotransmitters and neurotransmitter receptors

- Muscular tissue: Muscle types, organization and functions. The theories of muscle contraction. Disorders of muscle structure and function. Normal and abnormal electromyogram
- Bone and Connective tissues: The physiology of connective tissue proper-cells, fibres and ground substance. Physiology of cartilage and bone: Functional organization, functions, metabolism and disorders. Composition and functions of synovial membranes and fluids
- Blood and blood components: Blood composition and functions; plasma, serum, formed elements and the immune system. Physiology of blood of blood group and blood group serology. Blood coagulation and haemostasis.
- Immune system: Physiology of lymphoid organs mucosa and vascular associated lymphoid tissues, and mononuclear phagocytic cell functions. Cellular interactions in body defence. Pathophysiology of HIV/AIDs and other immune disorders. Interaction between nervous, endocrine and immune systems
- Epithelial tissue: Functional organization, functions and disorders of lining epithelia, mucous and serous membranes. General physiology of exocrine and endocrine glands

### ***Systemic Physiology***

- Cardiovascular system: Functional organization of the heart and the blood vessels, physics of flow in tubes and haemodynamics. Electrical activity of the heart and the electrocardiogram. Blood volume, cardiac output and blood pressure. Integrated control mechanisms. Response to exercise and training. Haemorrhage and shock. Foetal and neonatal circulation; Circulation through special regions.
- Respiratory system: Functional organisation. Gas laws and physical properties of gases. Breathing, ventilation, lung volumes and capacities. Lung morphometry; Alveolar function. Air-blood barrier. Pulmonary circulation and ventilation perfusion ratios. Integrated control mechanisms and acid base balance. None oneatmosphere respiratory functions. Non-respiratory functions of the lungs.

- Gastrointestinal system: Functional organization and design. Humoral and neuromyogenic control of regional gut functions. Gut motility and secretion. Gastrointestinal intrinsic and extrinsic glands. Basic nutrition and regional metabolism. Appetite and satiety: regulation of food and water intake. Digestion, absorption, and assimilation. Liver and the biliary system.
- Renal system: Functional organization of the urinary system- kidney, cortex and medulla. The nephron and its functions-osmoregulation, acid-base and electrolyte balance and the kidney. Concept of glomerular filtration rate and renal clearance. Hormonal functions of the kidney. Integrated regulation of blood osmolality, volume and pressure. Autoregulatory control mechanisms. Functional organization of the urinary bladder and micturition reflex.
- The endocrine system: Location, organisation, functions and integrated control of discrete endocrine organs. The hypothalamus, hypothalamo-hypophyseal axis and the pituitary. Pineal gland and its functions. Thyroid hormones and iodine metabolism. Parathormone, calcitonin, vitamin D and calcium metabolism. Adrenal medulla and the catecholamines. The adrenal cortex and the corticoids. The gonads and the sex hormones. The endocrine pancreas and glucose homeostasis. Diffuse neuro-endocrine system. Other organs with endocrine or paracrine functions.
- Reproductive systems and human development: Functional organization and development of the reproductive system; puberty and the climacteric. Gametogenesis and semen formation. Testicular function and its regulation. Blood testis barrier. Epididymal function and vas deferens. Physiology of glands of male reproduction system - prostate, seminal vesicles, bulbourethral glands. Penile tumescence and detumescence, potency. Ovarian functions, reproductive cycles, ovulation, coitus and fertilization. Uterine and fallopian tubular functions and cyclical changes. Pregnancy, foeto-placenta unit, foetal homeostasis and development. Parturition and fetal adaptation at birth. Lactation, breast-feeding and neuro-hormonal control. Milk composition and functions. Physiological basis of cellular and organ ageing.
- Nervous system: Somatosensory nervous system. Functional organization of sensory receptors and organs. Peripheral sensory mechanisms, coding and information handling. Sensory pathways. Pain and pain behaviour and its central processing at the brainstem reticular formation and thalamus. Special senses: organs of vision, hearing, olfaction, balance and taste. Motor nervous system: Components of the spinal reflexes, the muscle spindle and golgi tendon organs. Central motor mechanisms at the spinal cord, the brain stem, the cerebellum and cerebrum. Concept of upper and lower motor neurons. Vestibular function and balance. Sub cortical motor control.

Higher neural functions: Regional cortical functions, language and speech, learning and memory, motivation and behaviour. Cortical dominance and lateralization. Reticular formation mechanisms of sleep and arousal. Cerebral blood flow regulation, physiological blood brain barrier, cerebral-spinal fluid-formation, composition and function. Blood-CSF barrier. Autonomic Nervous system: Sympathetic, parasympathetic and enteric nervous systems. Hierarchical organization and their regulation. Control of visceral functions; the hypothalamic nuclei, functions and connections. Integration of autonomic reflexes, vital centres and vegetative functions. Body temperature regulation and skin function

- Integument system. Physiology of the skin and its appendages; nails, hair and breast. The skin in body immunity, metabolism and homeostasis
- Musculoskeletal system: Physiology of bone and muscle as a system (functional organization). Musculoskeletal disorders.

## 2.3 Human Anatomy (8 Units)

### 1. Course Purpose

To enable the student understand the development, gross and microscopic organization of the human body.

### 2. Course Outcomes

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

- a) Describe the development, gross anatomy and histology of the head and neck structures.
- b) Outline the development, gross anatomy and histology of the other body systems.

### 3. Course Content

#### **Cell and Tissue Structure and Function**

- Cell: cell theory, cell structure and organelles; cell functions and functional specialization, cell cycle regulation and disorders.
- Supporting tissue: Classification, cell types, structure, functions of fibrous tissue, cartilage, bone and blood and applied anatomy.

- Propulsion tissue: classification, structure, characteristics, regeneration, distribution and functions.
- Nervous tissue: structural features of neurons and neuroglial cells; organization of peripheral nerves and ganglia.
- Epithelial tissue: characteristics, structural features, classification, distribution, functions and applied anatomy.

### ***Principles and concepts of human genetics***

- Genetic code and chromosomes; gene expression, genetic drift and polymorphism, multifactorial traits and polygenic inheritance patterns, polymorphism and linkage disequilibrium.

### ***Development of the Human Embryo***

- Reproductive cycles and female reproductive system
- Gametogenesis. Gamete viability and transport. Fertilization: definition, events and results. Formation and transport of the morular. Blastula, normal and abnormal implantation. Bilaminar germinal disc, gastrulation, neurulation.
- Embryonic folding and organogenesis. Placenta and foetal membranes. Umbilical cord and twinning. Teratology and teratogenesis.
- Neural tube formation, derivatives and anomalies.
- Pharyngeal arches, origin, derivatives and anomalies. Morphogenesis and defects of the face, nose, palate, maxilla, mandible and tongue.
- Development and anomalies of the cardiovascular, reticulo-endothelial, endocrine, respiratory, musculo-skeletal, digestive and uro-genital systems. Specialised sensory organs and the integuments.

### ***Gross and applied Anatomy***

- Head and neck: Osteology, innervation, lymphatics and blood supply, musculature and their relationships.
- Oral cavity; organization of the lips, tongue, palate, teeth, gingivae and the salivary glands.
- Outline of osteology, innervation, lymphatics and blood supply, musculature and their relationships in neural system, the thorax, abdominal cavity, pelvic region and upper and lower limbs.



***Microscopic organization of human body organs***

- Introduction to histological techniques
- Skin: structure appendages, adaptations and functions
- Respiratory system: structure of the nasal cavity; larynx, trachea, the bronchial tree and alveoli.
- Circulatory and lymphatic systems; organization of the blood vessels and the heart, lymph nodes, tonsils, thymus and the spleen.
- Nervous System: Structural and functional organization of the spinal cord, brain, peripheral nerves, ganglia, receptors of general and special sensation.
- Propulsion tissue (muscle and bone): microscopic organization, cell types and features of skeletal, smooth, cardiac muscles and bone.
- Digestive system: major mucosal cell types, hepato-biliary structures and pancreas.
- Endocrine system: microscopic organization, cell types and their features of pituitary, pineal thyroid, parathyroid, endocrine pancreas, adrenal glands.
- Genito-urinary system.

## 2.4 Oral Biology (7 Units)

### **1. Course Purpose**

To enable the student understand the development, structure and functions of the oro-facial tissues.

### **2. Course Outcomes**

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

- a) Describe the development, gross anatomy and histology of the dental and periodontal tissues.
- b) Describe the development, gross anatomy and histology of the para-oral tissues and structures.
- c) Explain the physiological processes of the oral and para-oral tissues and structures.

### **3. Course Content**

#### ***Introduction***

- Terminologies and nomenclature used in the course including the Palmer and Federation Dentaire Internationale (FDI) classifications.
- Techniques: Preparation of tissues for gross and microscopic examination, fixation, and embedding, staining use of microtome. Microscopes, light, polarizing, electro (scanning, transmitting). Guidelines on dental histology, decalcified sections, ground sections.

#### ***Development and histology of the dental and paradental tissues***

- Amelogenesis, dentinogenesis, cementogenesis and the development of the pulp.
- Development and histology of the periodontium: Gingivae, oral mucosa, periodontal ligament, alveolar bone and cementum.
- Development and histology of the face, jaws, salivary glands and palate

#### ***Structure of the dental and periodontal tissues***

- Enamel dentine, pulp, periodontium, periodontal ligament, cementum, alveolar bone and gingiva.
- Tooth morphology eruption and chronology: Features of crown and root, general characteristics of deciduous and permanent dentition. Arrangement of teeth in arches. Eruption and shedding of teeth.

#### ***Physiological processes of oral and para-oral tissues and structures***

- Calcium and Phosphate Metabolism
- Chemical Composition of Teeth: Chemical and structure of enamel; amelogenesis, enamel matrix. Microscopy (SEM, TEM) of calcium hydroxyl phosphate (Apatite) crystallites and their clinical correlations. Chemical structural and function of dentine dentinogenesis, dentine matrix.
- Collagen metabolism and mineralisation of dental structures
- Repair and regeneration of dental structures
- Permeability and age changes in dental and oral tissue:
- Permeability processes, relative permeability of enamel, dentine, cementum, and oral mucosa.
- Fluorides and fluorosis

- Mastication and swallowing
- Speech sound, phonation: physiology, resonance, stammering and snoring.
- Influence of diet and hormones on oral structures.
- Integuments of teeth
- Nasmyth's membrane cuticles, pellicle, plaque and calculus.
- Physiology of saliva
- Defence mechanisms of the oral cavity
- Sensation arising from the oral cavity
- Introduction to occlusion
- Applied oral biology

## 2.5 General Human Pathology (9 Units)

### **1. Course Purpose**

To enable the student understand the aetiology and mechanisms of human diseases.

### **2. Course Outcomes**

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

- a) Describe the aetiology, progression and host response to human diseases.
- b) Classify, characterize and give the pathophysiology of infections caused by bacteria, viruses, prions, parasites and fungi.
- c) Describe the structure, functional organization and pathologies of the immune system.
- d) Describe anatomy, functional organization and pathologies of the haemopoietic and reticuloendothelial tissues.
- e) Describe laboratory methods used in assessment of normal and abnormal metabolic, physiologic and regulatory pathways.

### **3. Course Content**

#### ***Principles of pathology***

- Terminology, definitions and concepts.
- Cell types, growth and differentiation, cell and tissue injury.
- Inflammation, tissue repair and regeneration.
- Neoplasia: Classification of neoplasms, carcinogenesis; pathogenesis of neoplasms; tumour immunology; paraneoplastic manifestations; cancer epidemiology and prevention.
- Congenital and acquired disorders of: Central and peripheral nervous systems; Skin, bone and connective tissue; Respiratory system; Cardiovascular system; Gastrointestinal system; Renal/urinary system; Reproductive system; Endocrine system.

#### ***Microbiology***

- Classification and taxonomy of bacterial, parasitic, fungal, prions and viral agents. Culture of microorganisms. Virulence of microbiological agents. Principles of diagnostic procedures in bacteriology, parasitology, mycology and virology. Asepsis and use of anti- microbial agents.

#### ***Immunology***

- Functional organization of the immune system: Innate and acquired immunity; active, passive and adaptive immunity; humoral and cellular immunity; diversity of immune response; damaging effects of the immune response; regulation of Immune response.
- Host defense against pathogens: Innate and adaptive immune defenses mechanisms used by pathogens to evade the immune response.
- Vaccine production, schedules, administration and associated complications. Immunodiagnostic tests.

#### ***Haematology***

- Erythrocyte and leukocyte disorders, haemostasis and coagulation, blood neoplasms and blood transfusions.

#### ***Clinical Chemistry***

- Specimen collection, processing and analysis; interpretation of results; predictive values and efficiency of a test, test selection; quality assurance in clinical chemistry.

## 2.6 Pharmacology and Therapeutics (5 Units)

### 1. Course Purpose

To equip students with knowledge of medical drugs, their principles of action and rational use.

### 2. Course Outcomes

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

- a) Describe the general principles of pharmacokinetics and pharmacodynamics
- b) Describe the classification of drugs and other therapeutic agents.
- c) Explain therapeutic principles of medical drugs and agents as related to dentistry.

### 3. Course Content

#### ***Principles of pharmacology***

- Introductory pharmacology. Pharmacokinetic and pharmacodynamic concepts in drug therapy including drug interactions.
- Antimicrobials: Introduction to antimicrobials. Antibiotics, antifungals.
- Antiparasitic and antivirals.
- Analgesics: Non-narcotic and Narcotic drugs
- Anaesthetics: Local and general anaesthetics. Muscle relaxants
- Systemic Pharmacology: Drugs used for disorders of the cardiovascular, renal, alimentary, respiratory, endocrine, nervous, musculoskeletal, dermatological and haemopoietic systems.
- Vitamins: clinical pharmacology of endogenous and exogenous vitamins.
- Anticancer Agents:

#### ***Therapeutics***

- Evidence based use of drugs and modes of drug administration.

## 2.7 General Medicine (5 Units)

### 1. Course Purpose

To enable the student understand the aspects of medical conditions relevant to dentistry.

### 2. Course Outcomes

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

- a) Perform patient evaluation
- b) Diagnose common medical conditions and institute appropriate management including referral.
- c) Diagnose medical emergencies and offer basic life support.

### 3. Course Content

- Medical history, physical examination and investigations.
- Disorders of the cardiovascular system, respiratory system, endocrine, nervous, alimentary canal, musculoskeletal and connective tissue and renal systems.
- Disorders of haemostasis and haematopoiesis.
- Overview of medical emergencies and their management.

## 2.8 Principles of General Surgery (5 Units)

### 1. Course Purpose

To enable the student understand the principles of general surgery.

### 2. Course Outcomes

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

- a) Explain basic principles of general surgery
- b) Obtain relevant surgical history; perform physical examination and request appropriate investigations.
- c) Diagnose common surgical conditions and refer accordingly.
- d) Diagnose surgical emergencies and perform basic life support.

### **3. Course Content**

- Principles of surgical treatment, Inflammation and wound healing.
- Surgical Diagnosis: History taking and assessment of patients with surgical conditions.
- Trauma: Head injury. Thermal and chemical injuries. Soft tissue injuries, fractures and Joint Injuries, bone healing, complications of bone healing.
- Tumours and cysts.
- Haemorrhage and Shock.
- Blood transfusion, fluid and electrolyte balance.
- Ulcerations, gangrene, sinuses and fistulae
- General and local anaesthesia.
- ENT: surgical anatomy, infections and neoplasm of the ear, nose and throat. Tracheostomy, its indications, techniques and complications.
- Ophthalmology: surgical anatomy, optical system, infectious and surgical conditions of the eye.
- Surgical emergencies and Cardiopulmonary resuscitation.

## **2.9 Periodontology and Periodontics (10 Units)**

### **1. Course Purpose**

To enable the student to effectively manage diseases and conditions of the tooth supporting structures.

### **2. Course Outcomes**

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

- a) Explain the pathophysiology of periodontal diseases and conditions.
- b) Explain principles of periodontal diagnosis and treatment.
- c) Diagnose and treat common periodontal diseases and conditions and impart oral health education and refer when appropriate.

- d) Effectively communicate the treatment plan and obtain an informed consent.
- e) Provide supportive periodontal therapy.

### **3. Course Content**

- The normal periodontium (anatomy, and aging of the periodontium)
- Classification of periodontal diseases and conditions
- Fundamentals of periodontal disease epidemiology
- Periodontal pathology
- Masticatory system disorders with periodontal bearing
- Aetiology of periodontal diseases (Pathogenesis, role of dental calculus and other local predisposing factors, periodontal microbiology, genetic factors, molecular biology of the host-microbe interaction in periodontal disease, smoking and periodontal disease, periodontal-systemic inter-relationships)
- Treatment of periodontal disease (diagnosis, prognosis and treatment planning and communication to the patient, treatment of periodontal emergencies, non-surgical and surgical therapy, periodontal-restorative interrelationships and maintenance)
- Introduction to dental implantology.

## **2.10 Oral Medicine (3 units)**

### **1. Course Purpose**

To enable the student understand the management of oro-facial diseases and disorders.

### **2. Course Outcomes**

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

- a) Explain principles of diagnosis and treatment of common orofacial diseases and disorders.
- b) Obtain and record an accurate and comprehensive history and perform appropriate physical examination.
- c) Diagnose and treat common orofacial diseases and disorders and refer as appropriate.



- d) Effectively communicate the treatment plan and obtain an informed consent.
- e) Provide appropriate supportive therapy.

### **3. Course Content**

- Oral Diagnostics: History taking, clinical examination, orofacial assessment, use of diagnostic aids in the diagnosis of orofacial diseases and disorders.
- Management of orofacial infections and disorders

## **2.11 Oral Pathology (5 units)**

### **1. Course Purpose**

To enable the student understand the aetiology and pathogenesis of orofacial diseases and disorders.

### **2. Course Outcomes**

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

- a) Describe the common orofacial diseases and disorders, their aetiology, progression and/or propagation.
- b) Classify common orofacial diseases and disorders and discuss their clinico-pathological features.
- c) Interpret the results of appropriate clinical, radiological and laboratory investigation.
- d) Carry out basic diagnostic procedures and treatment for common orofacial diseases and disorders and refer when appropriate.

### **3. Course Content**

- Dental caries, diseases of the pulp and periapical periodontitis, and diseases of the periodontium: regressive changes in the dental tissues.
- Malformation and developmental changes in the face, jaws, dentition and oral soft tissues odontogenic neoplasm.
- Disorders of the oral mucosa. Ulcerative, vesicular and bullous lesions of the oral mucosa. Miscellaneous disorders of the oral mucosa.
- Infective conditions of the oral mucosa.

- Benign tumour and fibrous connective tissue hyperplasias of the oral mucosa.
- Oral cancer and pre-cancer and other malignant neoplasms of the oral mucosa.
- Diseases and disorders of the salivary glands. Diseases of the jawbone, osteodystrophies affecting the jaw and diseases of the temporomandibular joint, oral aspects of blood and metabolic diseases. Cysts and cyst-like diseases. Immunological aspects of oral diseases. Oral manifestation of systemic diseases and therapy.
- Introduction to forensic odontology. Diagnosis of physical and chemical injuries to the face and jaws, components of a basic forensic odontology examination and police/legal report.

## 2.12 Oral and Maxillofacial Surgery (10 Units)

### **1. Course Purpose**

To enable the student to manage common surgical oral and maxillofacial conditions.

### **2. Course Outcomes**

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

- a) Describe the general principles of oral and maxillofacial surgery.
- b) Diagnose and manage common surgical oral and dento-alveolar conditions and refer as appropriate.
- c) Effectively communicate the treatment plan and obtain an informed consent.

### **3. Course Content**

- Basic principles of oral and maxillofacial surgery; Infection prevention and control, waste management. Flap design, suture materials and dressings.
- Patient evaluation, diagnostic aids, diagnosis and treatment planning, review of oral and craniofacial anatomy.
- Exodontia and minor oral surgical procedures, wound healing and care of surgical wounds.
- Oral and maxillofacial infections and their management.
- Management of cysts of the head and neck region; craniomaxillofacial skeletal

dysplasias; neoplasms of the head and neck region; vasoformative disorders in the head and neck, salivary gland disease, craniomaxillofacial trauma, dysplastic and metabolic skeletal disorders in the head and neck, craniofacial congenital anomalies, temporomandibular joint disorders.

- Surgical aspects of prosthodontics, orthodontics and implantology.
- Therapeutics in dental and oral surgical practice.

## 2.13 Oral-maxillofacial Radiology and Imaging (5 Units)

### 1. *Course Purpose*

To enable the student understand the use of radiological techniques and imaging in the diagnosis of oral and maxillofacial conditions.

### 2. *Course Outcomes*

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

- a) Describe the basic principles of diagnostic imaging
- b) Describe and practice radiation protection and safety.
- c) Perform and interpret basic oral and maxillofacial radiographic examinations.

### 3. *Course Content*

#### *Physical principles of radiology*

- The Dental X-ray machine
- Production and properties of X-rays
- Interaction of X-rays with matter
- Image receptors (radiographic film and digital sensors)
- Principles of image production
- Radiation biology and dosimetry
- Radiation protection and safety
- Principles of image production in Ultrasound, CT, ultrasound, MRI and CBCT

***Radiography and Imaging***

- Radiation geometry
- Bitewing techniques
- Intraoral periapical techniques
- Occlusal techniques
- Dental panoramic tomography
- Extraoral radiographic techniques relevant to dentistry
- Radiographic quality assurance

***Radiology and image interpretation***

- Radiological investigation and diagnosis of caries, periodontal disease, endodontic lesions; periapical, developmental disorders; cysts, tumours, fibro-osseous lesions, infections malignancies, systemic diseases manifested in the oro-facial region. Localisation of impacted teeth. Radiological diagnosis of dental, mandibular and maxillofacial trauma. Radiology of salivary glands, the skull and TMJ, sinuses. Forensic radiology. Roles of Ultrasonography, CT, MRI and radioisotope scanning in management of dental and oro-facial lesions.

## 2.14 Oro-facial pain and anxiety management (8 Units)

**1. Course Purpose**

To enable the student understand the significance of oro-facial pain and anxiety in the management of patients.

**2. Course Outcomes**

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

- a) Describe the aetiology, physiology and pathology of oro-facial pain
- b) Describe the origins and manifestation of anxiety in dental patients
- c) Assess and manage pain and anxiety in the dental patient

**3. Course Content**

- Philosophy of anxiety and pain control and patient management, including the

nature and purpose of pain.

- Review of physiologic and psychologic aspects of anxiety and pain.
- Review of airway anatomy and physiology.
- Physiologic monitoring of central nervous respiratory and cardiovascular systems: observation, oxygenation and ventilation, and monitoring equipment.
- Pharmacologic aspects of anxiety and pain control. Routes of drug administration. Sedatives and anxiolytics. Local anesthetics. Analgesics and antagonists. Adverse side effects. Drug interactions. Drug abuse.
- Control of preoperative and operative anxiety and pain. Patient evaluation: Psychological status, ASA physical status, type and extent of operative procedure.
- Nonpharmacologic methods of anxiety and pain control.
- Psychological and behavioural methods (anxiety management, relaxation techniques and systematic desensitization)
- Interpersonal strategies of patient management
- Hypnosis
- Electronic dental anesthesia
- Acupuncture/acupressure
- Local anesthesia: Review of related anatomy, and physiology, pharmacology, dosing, toxicity, and selection of agents.
- Techniques of administration: topical, infiltration (supraperiosteal), and nerve blocks. Alternative injections-to include periodontal ligament and intraosseous injections.
- Prevention, recognition and management of complications and emergencies.

## 2.15 Paediatric Dentistry (7 units)

### **1. Course Purpose**

To equip the student with knowledge and skills required in the management of oral conditions in the paediatric patient.

## **2. Course Outcome**

At the end of this course, the learner should be able to:

- a) Describe common pediatric dental conditions.
- b) To investigate, diagnose and manage the common paediatric oral health conditions.
- c) Demonstrate skills in behaviour management of paediatric dental patients.
- d) Apply preventive methods and oral health promotion plan for the patient.
- e) Demonstrate proficiency in the selection and utilization of biomaterials.

## **3. Course Content**

- Definition and scope of paediatric dentistry.
- Review of development and morphology of the primary and permanent dentition.
- Common oral health conditions in paediatric dentistry: congenital and developmental anomalies, dental caries, dental fluorosis, trauma, periodontal disease, tumours and cysts.
- Child development and psychology including children with special needs.
- Techniques of behaviour management (pharmacological and non-pharmacological).
- History- taking, investigations (clinical, radiographic, histological) diagnosis, comprehensive treatment planning and communication.
- Preventive management of the child and adolescent patient: oral health education, diet counselling, fluoride therapy, pit and fissure sealants.
- Local anaesthesia, tooth isolation, restorative procedures and application of biomaterials in paediatric dentistry. Endodontic therapy in paediatric patients.
- Management of traumatic injuries.
- A traumatic restorative technique.

- Child abuse and neglect. Law and ethical issues in the management of the paediatric dental patient.
- Multidisciplinary management e.g. cleft palate and lip.

## 2.16 Orthodontics (7 units)

### 1. Course Purpose

To equip the student with competencies in preventing and correcting dental malocclusions.

### 2. Course Outcome

At the end of this course, the learner will be able to:

- a) Manage patients with simple cases of malocclusions.
- b) Demonstrate skills in preventive and interceptive orthodontics.
- c) Design and fabricate simple – removable and fixed orthodontic appliances.

### 3. Course Content

- Orofacial and psychological growth and development of children.
- Occlusion and malocclusion: Aetiology, classification, investigations, diagnosis, and treatment planning.
- Principles of biological and biomechanical tooth movement.
- Interceptive orthodontics and prevention.
- Management: Impression taking, study models, removable appliances and habit breakers.
- Laboratory procedures for orthodontics Wire bending, biomaterials and techniques. Welding and soldering.
- Management of malocclusion and retention.
- Functional and myofunctional appliances and space management
- Introduction to fixed and surgical orthodontics.

- Introduction to cephalometrics.
- Preventive orthodontics.

## 2.17 Dental Biomaterials (6 units)

### **1. Course Purpose**

To equip students with knowledge and skills in the use of dental biomaterials.

### **2. Course Outcome**

At the end of the course the learner will be able to:

- a) Discuss dental biomaterials used in the management of patients.
- b) Manipulate appropriately dental biomaterials.
- c) Demonstrate skills in handling of dental biomaterial waste.

### **3. Course Content**

- Introduction to dental biomaterials.
- Structure and properties: Metals, ceramics, polymers and resins.
- Application of dental biomaterials and evaluation methods.
- Biological screening and biocompatibility.
- Laboratory materials: Gypsum products; formulation, setting reactions, properties, applications, Plaster of Paris, dental stone and die stone.
- Alternative materials: epoxy, silicophosphate, amalgam, metal plated dies. Dental waxes; Sources, chemistry, applications.
- Clinical materials: Dental acrylic polymers; Classification, composition, setting reactions, properties, handling and applications.
- Heat, cold and light cured resins.
- Artificial teeth materials: Acrylic, porcelain, and glass ceramic.
- Impression materials: Requisites, classification, properties, manipulation and applications.
- Elastic Impression Materials: hydrocolloids, polyvinyl siloxanes, condensation



silicones, polyethers and polysulphides.

- Dental cements: Zinc oxide eugenol; resin, Ortho ethoxy benzoic acid, vanillate ester reinforced. Zinc polycarboxylate, zinc phosphate, silicophosphate, silicate, and calcium hydroxide.
- Resin cements: Glass ionomer cements, Compomers, amalgomer and Polyphosphonate modified.
- Dental alloys; Principles of casting, classification, composition, properties, manipulation, applications, current modifications. Cast alloys; gold, nickel chromium, cobalt chromium, titanium.
- Implant Biomaterials: Pure commercial titanium, titanium-Vanadium alloy, zirconium and stainless steel.
- Vulcanised silicone rubber, latex, Polymethyl and methacrylate.
- Ceramics: bioglass, aluminium oxide, hydroxyl apatite. Combined titanium and ceramics.
- Quality control in dental biomaterials.

## 2.18 Restorative Dentistry and Fixed Prosthodontics (16 units)

### **1. Course Purpose**

To equip the student with knowledge and skills in the restoration and replacement of teeth.

### **2. Course Outcome**

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

- a) Diagnose and manage patients requiring restorative procedures.
- b) Perform operative dentistry procedures.
- c) Perform basic endodontic procedures.
- d) Perform basic fixed prosthodontic procedures.
- e) Be familiar with dental implant treatment.

### **3. Course Content**

#### ***Operative Dentistry***

- Introduction, definition and scope.
- Lesions affecting calcified tooth structure. Cavity classification and nomenclatures.
- Instruments and instrumentation: General classification, instruments for diagnosis, cavity preparation and restoration.
- Principles of tooth preparation: Definition. Need and objectives of restorations. Principles of cavity preparation.
- Patient assessment, examination, diagnosis and treatment planning.
- Moisture and pain control. Aseptic techniques, Lining and restorative materials, (amalgam and tooth coloured materials)- clinical application and techniques.
- Selection of suitable restorative material: Requirements of an ideal restorative material. Factors influencing selection of restorative material.
- Tooth form and occlusion: Inter-proximal relationship. Occlusal relationship.
- Aesthetic Dentistry: Principles of color: hue, chroma and value.
- Discolored teeth: Causes and management.
- Composite and Porcelain Veneers: preparation techniques, impression and cementation.

#### ***Endodontics***

- Anatomy and diseases of dental pulp.
- Diagnostic aids: Radiographs and vitality tests.
- Instruments and instrumentation techniques
- Pulp capping, pulpotomy, mummification, apexogenesis, apexification and pulpectomy.
- Techniques and Materials: Access cavity, Pulp extirpation. Determination of working length. Chemico-mechanical Preparation. Irrigants and medicaments. Obturation (techniques and materials).
- Root resorption, perio-endo lesions, endodontic emergencies, endodontic complications and management.
- Surgical Endodontics: Principles, indication, techniques, incisions, Apicectomy, hemisection and root amputation.

- Restoration of root treated teeth.

### ***Fixed Prosthodontics***

- Introduction, patient selection and evaluation. Principles of occlusion and occlusal equilibration.
- Crowns, partial veneers, three quarter crowns, labial veneers, onlays and inlays: Shade selection. Preparation techniques. Impression materials and technique. Tissue management and temporary crowns. Cementation – materials and techniques.
- Bridges: Types of bridge, components, clinical and laboratory techniques. Temporary bridge preparation – direct and indirect technique and cementation. Care and maintenance of fixed restoration. Complications and their management.

### ***Introduction to dental implants***

## 2.19 Prosthetic Dentistry and Dental Technology (16 units)

### **1. Course Purpose**

Enable the learner to acquire skills and knowledge in diagnosis, treatment planning and management of edentulous and partially edentulous patients.

### **2. Course Outcome**

At the end of the course, the learner will be able to

- a) Diagnose and manage edentulous and partially edentulous patients.
- b) Perform laboratory procedures relevant to prosthetics.
- c) Participate in multidisciplinary care of patients.

### **3. Course Content**

*Dental technology:* Laboratory equipment, instruments and materials. Anatomical changes associated with loss of teeth. Anatomical landmarks of edentulous mouth. Diagnosis and treatment planning. Impression trays, stock trays and special trays. Impressions taking from demonstration cast (models). Boxing impression. Base plates: types, material and their requirements, methods of constructing base plates. Articulators. Occlusion and articulation: definition, brief

principles of balanced articulation, methods of obtaining balanced articulation, occlusal grinding. Occlusal rims: materials used, types and application. Laboratory procedures: waxing up dentures, processing and finishing denture. Introduction to implant crown fabrication.

### ***Prosthetics***

- Complete denture: Investigation, diagnosis and treatment planning. Impression: types, techniques, mouth preparations and materials. Selection of teeth. Maxilla-mandibular relation and jaw registration. Principles of teeth arrangement in reference to jaw relations. Complete denture occlusion. Try in stage and denture insertion.
- Retention: Definition and contributing factors, occlusal surface; muscular forces, impression surface; physical forces, role of saliva, area of impression surface, accuracy of fit, border seal and gravity.
- Support: Definition, quality and quantity of denture bearing area, mucosa, residual alveolar ridge and arch form.
- Stability: Definition, factors contributing to instability of denture.
- Dentist-technologists communications.
- Difficult cases, complications and their management.
- Immediate and overdentures, single complete denture, dental implant prosthesis, denture duplication, relining, rebasing and repair

### ***Partial Dentures***

- Introduction and classification, occlusion, patient selection and evaluation, diagnosis and treatment plan.
- Components, impressions, dental surveying, mouth preparations, wax pattern, investment techniques, casting technology, devesting, finishing and polishing, try-in framework, jaw registration, try-in framework with teeth, insertion and aftercare, provisional prosthesis, patient counselling/ communication.

## **2.20 Dental Public Health and Research Methods** (12 units)

### ***1. Course Purpose***

To equip the students with knowledge and skills in the prevention of oral and dental

diseases/ conditions, promotion of good oral health and to conduct research.

## **2. Course Outcome**

At the end of this course, the learner will be able to:

- a) Explain principles and methods of prevention of oral health diseases/ conditions.
- b) Promote good oral healthcare practices.
- c) Describe the psychological and social factors influencing patient behaviour.
- d) Carry out basic research.

## **3. Course Content**

### ***Behavioural Sciences***

- Concept and Role of psychology, sociology and anthropology in dentistry, psycho-social and intellectual development, structure and personal determinants of personality and self-determination, health seeking behaviour, intelligence, thinking, learning and memory, motivation, emotions and behaviour change, fear and anxiety.
- Theories of human behaviour: Abraham Maslow's hierarchy of needs.
- Socio-cultural habits and practices that influence oral health, diet, culture and oral diseases, awareness of ethnodontistry, alternative dentistry and biomedicine, social formation of the individual.
- Group and group behaviour; classification of groups, functions of groups to members, group dynamics
- Pain and pain behaviour: definition, psychosocial and cultural factors that influence pain and pain behaviour.

### ***Demography***

- Demographic variables: Mortality, fertility and migration,
- Sources and uses of demographic data, census, vital statistics, demographic transition theory, population structure and its effects on planning for health services.

### ***Epidemiology***

- Concepts and types of epidemiology, sources and uses of epidemiological data, patterns of disease, "person, place and time" model, host-agent-

environment" model.

- Epidemics; definitions and control.
- Natural history of a disease and its importance in disease prevention.
- Measures of association (risk, relative risk, attributable risk, odds ratio).
- Prevention and Control of Oral Diseases:
- Dental fluorosis: Epidemiology and aetiology, indices prevention and control.
- Dental caries: Aetiology, epidemiology, indices, diet and dental caries, caries risk assessment, prevention and control.
- Periodontal diseases: Aetiology, epidemiology and indices, Prevention and control,
- Malocclusion: Aetiology, epidemiology and indices, prevention and control,
- Oral and maxillofacial tumors and cysts: Aetiology, epidemiology and indices, prevention and control.
- Head and neck trauma: Aetiology, epidemiology and indices, prevention and control.

### ***Occupational hazards and waste management in dentistry***

#### ***Research methods***

- Concepts, rationale and significance of research, types of research (operational, basic and applied), sources of information, review and critique of literature, selection of research topic.
- Research proposal development: Hypothesis, study designs, variables, sampling, data collection and management; calibration, research tools, ethical and legal considerations in human research, finance and time management, Referencing, Report writing and dissemination.

#### ***Biostatistics***

- Concepts and principles, sources of health statistical data, variables and scales of measurements, organization and presentation methods.
- Data summarization-Measures of central tendency (mean, median, mode, quantities), Measures of dispersion (range, standard deviation, coefficient of variation), Principles of probability theory, Probability distribution (binomial and normal), Frequency distribution, Statistical inference, Estimations, Tests

of significance -Parametric -Student's T-test, Standard normal deviation test (Z-test), Non-parametric-Chi-square (X<sup>2</sup>) test)

- Statistical Analysis Software: MS Excel, SPSS and others.

### ***Oral Health Education and Promotion***

- Introduction to and principles of health education and promotion.
- Patient education and motivation: Oral hygiene, planning model and rationale of patient education, school health education and planning process for community health education.
- Methods and communication media used in oral health education, preparation of oral health education materials.

## **2.21 Leadership and Management (3 units)**

### ***1. Course Purpose***

To equip students with leadership and management skills.

### ***2. Course Outcome***

At the end of this course, the learner will be able to:

- a) Demonstrate skills in leadership and management of healthcare systems.
- b) Discuss medico-legal and ethical issues related to health practice.
- c) Demonstrate adherence to ethical behaviour and professional conduct.
- d) Demonstrate skills in health information management and communication.
- e) Describe principles of entrepreneurship.

### ***3. Course Content***

- Introduction to Leadership and Management: concepts, theories, styles and practices;
- Roles and functions of leadership and management
- Importance and development of vision and mission statements

- Organization, leadership, management and governance in health care systems.
- Resource mobilization and management.
- Medico-legal issues, ethics and professionalism.
- Health informatics and communication.
- Principles of entrepreneurship.
- Project management, monitoring and evaluation.

## 2.22 Basic Life Support and Medical Emergencies (2 unit)

### 1. Course Purpose

To enable the dental practitioner competently manage medical emergencies and provide basic life support.

### 2. Course Outcome

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

- a) Diagnose medical emergencies
- b) Provide basic life support, stabilize and refer when necessary.
- c) Identify patients at risk of medical problems and take measures to reduce the chance of a problem arising.

### 3. Course Content

- Medical emergencies: Syncope, hypoglycemia, hyperglycemia, hypertension, seizures, asthma, asphyxia and anaphylaxis, bleeding, shock, angina, myocardial infarction, cardiopulmonary arrest and others.
- Emergency drugs: adrenalin, oxygen, oral glucose solution, glucagon injection, valium, salbutamol inhaler, midazolam, glyceryl trinitrate, atropine, hydrocortisone and others.
- Techniques and equipment: portal oxygen cylinder, oxygen face mask, oral pharyngeal airways, portable suction and suction catheters and tubings, disposable syringes and needles, automated blood glucose measurement



device, space deviser for inhaled bronchodilators, automated external difibrilator (DC), emergency telephone numbers and others.

- Skills: CPR, AED, ABCDE approach, IV Infusion, Oxygen administration, Tracheostomy, Resuscitation, Effective patient transfer, Communication and others.

## 2.23 Common undergraduate courses (10 Units)

## 2.24 Dental Electives (8 Units)

### **1. Course Purpose**

To provide students with opportunities to widen their curriculum based experiences in areas of their interest which will be useful in their career.

### **2. Course Outcomes**

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

- a) Provide a report on their elective experience.

### **General Guidelines**

- a) During this period students may choose to take a programme in basic social or clinical sciences or any other field relevant to their future career.
- b) Develop a plan of their learning activities and the implementation process.
- c) The students will be responsible for making arrangements (including finances) pertaining to the elective.
- d) The students shall submit a plan of their activities for approval.
- e) Upon completion of the elective the students shall submit a written report.
- f) A confidential report shall be submitted to the Dean from the host institution regarding the students performance.
- g) The institution shall provide students with guidelines of their conduct during the elective.
- h) Students shall conform to the rules and regulations of the host institution during their electives. Where research is involved, approval will be sought from the host institution.

# Annexes

## **Annex 1: List of Suggested Books and Reference Materials**

### **(a) Important Notice to Students and all other Users**

The list herebelow indicates the suggested Text Books which BDS students should find relevant and useful. While every effort has been made to ensure that the list is comprehensive and accurate, at the time of publication, the Board cannot take any responsibility for omissions or commissions that may lead to the acquisition of material not necessarily required for a particular course at any given time. Furthermore, the Board stresses that the list is not exhaustive; and whereas every effort has been made to ensure currency and accuracy, it remains the sole responsibility of course leaders at every academic institution, to provide proper guidance to students in ensuring the acquisition, purchase as well as reference to the most recent sources and any new developments in the dental field.

### **(b) List of Suggested Books and Reference Materials**

1. Melfi, R.C and Alley, K.E (2000). *Permar's Oral Embryology and Microscopic Anatomy: A Textbook for Students in Dental Hygiene* (10<sup>th</sup> edition). Lippincott Williams & Wilkins.
2. Nelson, Stanley, J (2009). *Wheeler's Dental Anatomy, Physiology and Occlusion* (9<sup>th</sup> edition). Saunders.
3. Das, J.C (1985). *Pedodontics*. Current Distributors.
4. Carr, Allan, B and Brown, T David (2010). *McCracken's Removable Partial Prosthodontics* (12<sup>th</sup> edition). Mosby.
5. Dean, Jeffrey, A; Avery David, R and McDonald Ralph, E (2010). *McDonald and Avery Dentistry for the Child and Adolescent*. Elsevier Health Sciences.
6. Baer, S. Adela (1971). *Central Concepts of Biology*. Macmillan.
7. Marsh, D Philip, et-al (2009). *Oral Microbiology*. Elsevier health Sciences, UK.
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