Dow University of Health Sciences

Dow Dental College

Curriculum
Bachelor of Dentistry (BDS) 1st Year
Program

2020-2021

DUHS Vision

"To be a pre-eminent academic institution committed to changing and saving lives "

DUHS Mission

"Providing outstanding patient-centered education,
Training and clinical care informed by cutting edge research and innovation generating and disseminating new knowledge"

DUHS Core Values I

1. CUSTOMER SERVICE
Put patients and students first.
2. EMPATHY & COMPASSION Understand before you judge
Be concerned for sufferings & misfortune of others
3. EXCELLENCE
Be the best and commit to exceptional quality and service
4. INNOVATION
Encourage curiosity, imagine, create and share

DUHS Core Values II

5. TEAMWORK
Engage and collaborate
6. INTEGRITY AND LEADERSHIP
Be a role model and influence others to achieve their best
Have the courage to do the right thing
Hold yourself and others accountable
7. RESPECT & COLLEGIALITY
Be kind
Listen to understand
Value different opinions

BDS Program Mission

The mission of the BDS program at DUHS is to develop academic excellence and to deliver the utmost quality of scientifically proven preventive, educational and therapeutic services to the community. To provide the graduates a scholarly environment that fosters excellence in the lifelong goals of continuing education, scholarly activity, and of compassionate patient care.

BDS Program Outcomes

At the end of the 4-year BDS program, the graduate should be able to:

- Demonstrate professional attitudes expected from an ethical dental practitioner
- Manage community-based oral health effectively
- Manage individual patients for oral/dental healthcare ethically and professionally
- Lead a team of oral/dental healthcare professionals
- Engage in self-directed life-long learning for personal development

Affiliated Institutes

The DUHS-BDS program is employed in the three affiliate dental colleges of Dow University of Health Sciences. The program curriculum is developed in collaboration and consultation with all three.

Program Structure and Overview

The DUHS-BDS program is in accordance with the guidelines provided by PM&DC and HEC in 2016-2017. The program curriculum is designed with the intend to incorporate the following competencies into graduates:

Medical Expert	
Professional	Scholar
Collaborator	Leader
Communicator	Advocate

The program consists of two phases, completed over a period of four years. Phase 1 covers the basic sciences during the first two years. Phase 2 deals with the clinical science disciplines in the later two years. The process ensures development of novice learners into medical experts with the required knowledge and skills. Attitudinal competencies span over all four years longitudinally.

ANATOMY

COURSE CONTENT & OBJECTIVES

1. General anatomy & Histology
2. General Embryology
3. Head & Neck
4. Neuroanatomy
5. Abdomen & Thorax

COURSE TOPIC: GENERAL ANATOMY AND HISTOLOGY

S. No	LECTURE TOPICS	TOPIC OBJECTIVES
1	Introduction to Anatomy	Define anatomy. Compare the branches of anatomy with regard to their practical implications.
2	Terms of position and movements	Describe the location and movement of different parts of body with respect to various terms of position and movement.
3	Cell	Describe cell and cell organelles. Discuss functions of cells. Discuss cell cycle.
4	Epithelial Tissue	Compare different types of epithelia with regard to their features, functions and locations.
5	Connective Tissue	Classify the following with regard to their structures, functions and locations: - Connective tissue; Components of connective tissue.
6	Bones	Compare various types of bone with regard to their development, shape, histological features and blood supply.
7	Cartilages	Classify cartilages with regard to their location, morphology, histology and function.
8	Joints of Body	Relate the following: - Structure of different types of joint with their movements General features of synovial joints with their locations
9	Muscle	Classify muscles according to their macroscopic and microscopic structures and functions
10	Introduction to Limbs	Describe general arrangement of bones and muscles
11	Development of Musculoskeletal system	Discuss musculoskeletal system development
12	General organization of CVS	Discuss the organization of circulatory system
13	Histology of blood vessels	Compare the types of blood vessels with regard to their histology.
14	Microscopy and types of microscope	Demonstrate operational steps of microscope handling
15	Lymphatic system	Discuss the immune system.
16	Lymphoid tissue	Compare the lymphoid organs with regard to their histology and function
17	Skin and Fascia	Discuss the structure and distribution of skin and fascia
18	Histology of skin	Discuss the Gross & histological features of skin and its appendages.

COURSE TOPIC: GENERAL EMBRYOLOGY

S. No	LECTURE TOPICS	TOPIC OBJECTIVES
1	Introduction to Embryology	Define Embryology and Embryological terms Discuss the clinical application of embryology
2	Reproductive system	Identify parts of male and female reproductive system and their functions.
3	Uterine Cycle	
4	Cell division & Cell Cycle	Discuss types of cell division and their clinical importance.
5	Meiosis & Gametogenesis	Correlate the processes of meiosis and gametogenesis.
6	Fertilization and Implantation	Discuss the processes of fertilization & implantation. Discuss the following: Development of fetus Events occur during each week Derivatives of ectoderm, mesoderm and endoderm Role of teratogens in congenital anomalies Importance of antenatal diagnostic techniques
7	Development up to 3 weeks	
8	Embryonic Period	
9	Fetal Period	
10	Fetal membranes and Placenta	
11	Role of Genes & Teratogens in birth defects	
12	Antenatal diagnostic techniques	

COURSE TOPIC: HEAD AND NECK

S. NO	LECTURE TOPICS	TOPIC OBJECTIVES
1	Introduction of head and neck structures	Discuss the clinical relevance of the structures of skull as seen on 4 normas. Relate the features of different aspects of skull with their clinical relevance.
2	The 4 Normas of skull	
3	Osteology of mandible	Identify the structures associated with mandible on models.
4	The scalp	Discuss the clinical importance of the structures of scalp.

5	Face	Discuss the blood supply, nerve supply, lymphatic drainage and clinical conditions associated with muscles of facial expression.
6	Development of Face	Describe development and anomalies of face and pharyngeal apparatus. Discuss gross anatomy of orbit, eye and its contents. List the derivatives of optic cup. Discuss development of the eye.
7	Pharyngeal arches	
8	Orbital boundaries and contents	
9	Gross anatomy of eye ball	
10	Development of Eye	
11	External, middle, Internal ear	Discuss the clinical importance of the macroscopic structures of ear
12	Development of Ear	List the derivatives of otic vesicle.
13	Temporal fossa	Identify the structures of temporal and infra temporal region based on data provided.
14	Infratemporal fossa	
15	TMJ & Muscles of mastication	Discuss the articulation, neurovascular supply and the muscles of Temporomandibular joint
16	Nose & Paranasal sinuses	Discuss macroscopic and microscopic structures of nose and paranasal sinuses and their clinical application
17	Nose & Paranasal sinuses	Describe development of nose and paranasal sinuses
18	Oral cavity	Discuss the gross anatomy of oral cavity
19	Oral cavity	Differentiate among the microscopic features of contents of oral cavity
20	Tongue	Describe the macroscopic and microscopic features of tongue
21	Tongue & Palate	Discuss development of oral structures
22	Development of Teeth	Discuss common anomalies of oral structures
23	Major salivary glands	Discuss macroscopic structures of major salivary glands and their clinical importance
24	Salivary glands	Relate the histological differentiation of salivary glands with their function.
25	Major salivary glands	Discuss development of major salivary glands
26	Cervical vertebra	Identify the cervical vertebrae based on data provided. Discuss the importance of cervical vertebrae as landmarks
27	Skin, Fascia & neck muscles	Identify the macroscopic structures of the neck based on data provided.

28	Triangles of neck	Describe the boundaries of the triangles of neck and their contents
29	Pituitary & Pineal gland	Describe the macroscopic and microscopic structures and development of pituitary and pineal glands.
30	Thyroid & Parathyroid glands	Discuss gross anatomy and clinical importance of thyroid and parathyroid glands
31	Development of Thyroid & Parathyroid glands	Discuss development and anomalies of thyroid and parathyroid gland
32	Pituitary gland	Describe the dual origin of pituitary gland
33	Pharynx	Describe the division of pharynx
34	Larynx	Discuss the macroscopic and microscopic structures of the larynx
35	Trachea	Discuss the macroscopic and microscopic structures of trachea
36	Cranial nerves 5,7,9,10&12	Describe the course of cranial nerves and effects of their injury
37	Major Vessels of neck	Identify major arteries and their main branches in neck on models and normal subjects.
38	Head & neck	Discuss lymphatic drainage of head and neck.

COURSE TOPIC: NEUROANATOMY

S. No	LECTURE TOPICS	TOPIC OBJECTIVES
1	Cranial fossae	Describe features of cranial cavity.
2	Development of nervous system	List the steps of development of central nervous system.
3	Blood supply of brain and spinal cord	Discuss the clinical importance of blood supply of brain and spinal cord.
4	Meninges of the brain and spinal cord	Discuss the clinical importance of meninges of brain and spinal cord with regard to the following spaces: - Epidural, - Subdural, - Subarachnoid.
5	Dural venous sinuses	Describe the location and communications of Dural venous sinuses. Discuss the clinical significance of Dural venous sinuses.
6	Ventricular system of brain	Describe the structure of ventricular system. Correlate the structure of ventricular system with CSF disorders.

7	Brain stem	Describe the external features and attachment of cranial nerves with lesions.
8	Cerebellum	List the deep cerebellar nuclei. Describe the macroscopic features of the following structures: - Cerebellum - Diencephalon - Thalamus Describe the general distribution of white matter. Identify the following based on pictures/ models: - Functional cortical areas - Cranial nerve nuclei and their functional components - Brain and spinal cord (on radiographs). Describe the structural and functional organization of autonomic nervous system.
9	Diencephalon	
10	Cerebrum	
11	Cranial nerves I-XII	
12	Autonomic nervous system	
13	Imaging of Brain and spinal cord	

TOPIC: ABDOMEN AND THORAX

S. NO	LECTURE TOPICS	TOPIC OBJECTIVES
1	Introduction to thoracic cavity	Describe the boundaries of thoracic cavity and its contents
2	Mediastinum	Describe the boundaries and contents of mediastinum.
3	Gross and histology of thoracic part of respiratory tract	Identify the macroscopic and microscopic structures of lung based on data provided.
4	Development of respiratory system	List derivatives of lung bud
5	Overview of Pericardium and Heart	Describe the macroscopic structures of heart and pericardium
6	Development of CVS	List parts of primitives of heart tube & their derivatives
7	General Histological features of GIT	Differentiate among the parts of small & large intestine on the basis of histology
8	Development of GIT	List the derivatives of foregut, midgut & hindgut
9	introduction of abdomen	Quadrants, regions and the introduction of oesophagus, stomach, small and large intestine, pancreas, liver and spleen

PHYSIOLOGY

COURSE CONTENT & OBJECTIVES

1. **Basic Physiology**
2. **Blood**
3. **Nerve & Muscle**
4. **Cardiovascular**
5. **Respiratory**
6. **Neuroscience**
7. **Special senses & Endocrinology**
8. **Digestive and Urinary**

COURSE TOPIC: BASIC PHYSIOLOGY

S. No	LECTURE TOPIC	TOPIC OBJECTIVES
1.	Introduction of Physiology & Homeostasis	Discuss: - What is Physiology? - Importance of Physiology in modern medicine. - Basic life processes and survival needs of the body. - Principle of homeostasis as a central theme of Physiology. - Negative and positive feedback systems.
2.	Body fluid compartments	Describe the body fluid compartments. Discuss the composition of body fluid compartments.
3.	Cell membrane	Define cell. Discuss the importance of cell as the basic unit of life. Describe the composition of cell membrane.
4.	Cell organelle 1	Discuss the structure and functions of all components of a cell.

5.	Membrane transport 1	Discuss the types of membrane transport. Define Passive transport Define the following: - osmotic pressure - tonicity - bulk transport - phagocytosis - pinocytosis Compare types of solutions with regard to their tonicity.
6.	Membrane transport 2	Discuss Active transport Types of Active transport - Primary active transport - Secondary active transport

COURSE TOPIC: BLOOD

S. No	LECTURE TOPIC	TOPIC OBJECTIVES
1.	Composition of blood	Describe the components of blood and their functions. Describe the functions of blood.
2.	Erythropoiesis & Factors affecting erythropoiesis	Describe the structure and functions of erythrocytes. Draw a flow chart of RBCs production. Enumerate the sites of erythropoiesis. Discuss the humoral, maturation & nutritional factors affecting erythropoiesis.
3.	Hemoglobin- Anemia & Polycythemia	Discuss the formation, functions, fate and pathologies of hemoglobin. Define the following: - Anemia - Polycythemia. Classify anemia on the basis of - Morphology. - Etiology. Discuss various types of polycythemia.
4.	Blood groups	Discuss the following: - ABO blood types. - Rh blood types. - Mismatched blood transfusion hazards. - Erythroblastosis fetalis.
5.	Hemostasis 1	Define hemostasis. Discuss the events of hemostasis. List the contents and functions of platelets. Discuss the following - Intrinsic and extrinsic coagulation pathways

6.	Hemostasis 2	Balance between bleeding and coagulation Fibrinolytic mechanism Factors that prevent clotting in normal vascular system Conditions that cause excessive bleeding in human beings
7.	White blood cells	Discuss leukopoiesis and inflammation Differentiate among the types of white blood cells based on their function and physical characteristics
8.	Immunity- Antigen, antibody structure	Describe immunity and its types - Innate (non-adaptive) - Acquired (adaptive) Discuss types and functions of lymphocytes
9.	Humoral immunity &	Discuss the structure and mechanism of action of antigen and antibody Describe the complement system.
10.	Cell mediated immunity	Discuss Cell mediated immunity Types of T cells Coordinated working of Humoral and cell mediated immunity Describe allergy and hypersensitivity reactions.

COURSE TOPIC: Nerve and Muscle

S. No	LECTURE TOPIC	TOPIC OBJECTIVES
1.	Resting membrane potential	Discuss: - Distribution of ions across the plasma - Resting potential and its importance Define Nernst potential. Write the Nernst equation.
2.	Structure of neuron& synapse	Describe the structure and function of different parts of neuron. Define synapse. Discuss the following types of synapse - Electrical synapse - Chemical synapse
3.	Graded potential- Action potential- Properties & propagation	Discuss graded potential Discuss the action potential, its propagation in myelinated and non-myelinated nerve fibers. Describe the graph of action potential. Differentiate between graded and action potentials.
4.	Structure of skeletal muscle	Describe muscle tissue and its functions. Discuss organizational levels of skeletal muscle.
5.	Neuromuscular junction	Discuss the parts of neuromuscular junction (NMJ). Discuss the steps of impulse transmission through neuromuscular junction. Discuss the physiological basis of disorders of NMJ.
6.	Excitation contraction coupling & Mechanism of Skeletal muscle contraction	Discuss mechanism of muscle contraction in the skeletal muscle. Describe structure and function of sarcoplasmic reticulum and T-tubules. Define power stroke. Describe the role of ATP in muscle contraction. Define: - motor unit - motor unit recruitment - simple muscle twitch - summation - tetanization - fatigue Differentiate between isotonic and isometric muscle contraction.

7.	Smooth muscle	List the types of smooth muscles. Discuss the following: • Membrane & action potentials in smooth muscles. • Contractile mechanism of smooth muscles. • Nervous and hormonal control of smooth muscle contraction.
8.	Skeletal, Smooth & Cardiac muscle Comparison	Compare smooth, cardiac and skeletal muscles regarding their structure and function.

COURSE TOPIC: CARDIOVASCULAR SYSTEM

S. No	LECTURE TOPIC	TOPIC OBJECTIVES
1.	Structure of heart & Cardiac muscle	Discuss the physiology of cardiac muscle and the importance of intercalated discs in cardiac muscle function. Compare types of muscles with regard to their structure and functions. Correlate the structure of cardiac muscle to its function.
2.	Cardiac action potential Conduction system of heart	Discuss the cardiac action potential. Compare the skeletal muscle and heart regarding their action potentials. Discuss the electrical conduction system of heart and components Discuss role of SA node in conduction system of heart.
3.	Basic Electrocardiography 1	Draw electrocardiogram (ECG) of a normally functioning heart Discuss the following: - Myocardial events - 12 ECG leads - Tachycardia - Bradycardia
4.	Basic Electrocardiography 2	Define the Cardiac vector and axis of heart Discuss - Myocardial infarction/ischemia - Atrial flutter - Atrial fibrillation - Heart blocks
5.	Cardiac cycle / Heart sounds	Discuss the cardiac cycle Different phases of cardiac cycle Heart Sound in relation to phases of cardiac cycle

6.	Cardiac output Factors affecting cardiac output	Discuss the following - Cardiac output - Frank-Starling law - Nervous and chemical factors that alter heart rate, stroke volume, and cardiac output
7.	Hemodynamics	Discuss the physical characteristics of circulation Discuss the interrelationships of pressure, blood flow and resistance Discuss vascular distensibility and functions of the arterial and venous systems
8.	Blood pressure & its regulation 1	Define: - Systolic blood pressure - Diastolic blood pressure - Mean arterial blood pressure - Pulse pressure Discuss short term and intermediate regulations of blood pressure.
9.	Blood pressure & its regulation 2	Discuss long-term regulations of blood pressure. Describe the renin angiotensin aldosterone system
10.	Local control of blood flow & Microcirculation	Discuss the following - Local control of blood flow - Humoral control of circulation Discuss the capillary system, vasomotion and fluid-filtration across capillaries
11.	Circulatory Shock	Discuss the physiological causes of shock

COURSE TOPIC: RESPIRATORY SYSTEM

S. No	LECTURE TOPIC	TOPIC OBJECTIVES
1.	Respiratory passageways & alveoli-Pulmonary ventilation	List the structures that make up the respiratory system in correct order Discuss the functions of each structure of respiratory system Differentiate between the conducting and respiratory zones of respiratory passages
2.	Mechanics of Respiration	Basic mechanism for inspiration & Expiration Describe the roles of muscles of respiration in breathing Discuss: - Pressure gradients - Significance of dead space Boyle's law

3.	Lung volumes and capacities	Describe lung volumes and capacities in adult male
4.	Gas exchange & Diffusion	Discuss the relationship of partial pressure to a gas mixture Describe partial pressures of oxygen and carbon dioxide in venous and arterial blood, alveolar air and cells Discuss factors affecting exchange through respiratory membrane Compare inspired and alveolar air regarding their composition
5.	Transport of gases Oxygen-Hb dissociation curve	Discuss the role of partial pressure in gas transport by the blood Describe the transport of oxygen and carbon dioxide in blood Discuss the role of hemoglobin in oxygen transport Describe the factors affecting release or binding of oxygen to hemoglobin Discuss Bohr's and Haldane effects Interpret the oxygen hemoglobin dissociation curve graph
6.	Regulation of respiration	Describe the role of the four main groups of nuclei in the medulla and pons that control breathing Discuss the factors that can influence rate and depth of breathing Describe locations of chemoreceptors that monitor blood pH and gas concentrations Discuss the role of chemoreceptors in the regulation of respiration
7.	Effects of Exercise on Respiration	Discuss the Respiratory adaptations for exercise Role of respiratory system to maintain homeostasis during Exercise
8.	Respiratory disorders / Hypoxia	Discuss the causes of these respiratory disorders: - Emphysema - Bronchitis - Asthma - Pneumonia - Pulmonary edema - Hypoxia

COURSE TOPIC: NEUROSCIENCE

S. No	LECTURE TOPIC	TOPIC OBJECTIVES
1.	Electrical properties of neuron	Describe the basic organization of nervous system Discuss Electrical conduction across neuronal membrane, generation of action potential and transmission of nerve signal
2.	Synapse	Define synapse List the properties of synapse Discuss transmission of electrical signals between neurons
3.	Receptors	Describe the general characteristics of receptors Classify receptors according to location and stimulus type Discuss the following - Receptor potential - Transduction of sensory stimuli into nerve impulses
4.	Sensory pathways	List the different types of sensory pathways Discuss the transmission of sensory information into CNS (DCML) Discuss the transmission of sensory information into CNS (Anterolateral system)
5.	Analgesia system Types of Pain	Discuss types of pain, their qualities and pain receptors Discuss dual pathways for transmission of pain signals into CNS Discuss analgesia system in the brain and spinal cord Describe brain opioid system
6.	Spinal level of motor control Descending tracts (pyramidal & extra pyramidal)	Discuss the organization of the spinal cord for motor functions Describe the role of muscle spindles & Golgi tendon organs in muscle control Discuss cord reflexes Describe the pathway of pyramidal efferent tracts Compare pyramidal and extra pyramidal tracts regarding their origin, termination and function
7.	Brainstem	Describe the major functions o - Mid brain - Pons - Medulla oblongata Discuss the control of motor functions by the brain stem
8.	Cerebellum	Discuss the structure, functions, input and output connections of cerebellum Describe various cerebellar disorders
9.	Basal ganglia & Limbic system	Discuss the structure, functions, pathways and related disorders of basal ganglia List the components of limbic system Describe the functions of components of limbic system

10.	Autonomic nervous system (ANS)	Discuss the general organization and activation of ANS Discuss structure and functions of sympathetic, parasympathetic nervous system and adrenal medulla Compare the divisions of the ANS regarding origin of preganglionic fibers, location of ganglia and neurotransmitter substances Discuss the value of adrenal medullae in the function of the sympathetic nervous system.
11.	Sleep (Reticular activating system)	Discuss physiology of normal sleep REM & Non-REM sleep Different phases of sleep and their characteristics

COURSE TOPIC: SPECIAL SENSES & ENDOCRINOLOGY

S. No	LECTURE TOPIC	TOPIC OBJECTIVES
1.	Vision 1	Describe all layers and parts of eye Describe the physiological functions of each part of the eye Discuss refraction and refractory structures of the eye
2.	Vision 2	Discuss: - Errors of refraction and their corrections - Accommodation - Fluid system of eye - Anatomy of retina - Photochemistry of vision - Visual pathway and associated lesions Image formation
3.	Hearing and equilibrium	Discuss physiological anatomy of ear Describe the role of ossicles in the process of hearing Draw the auditory pathway Discuss conductive and perceptive deafness Explain the role of vestibular apparatus functions in monitoring equilibrium
4.	Sense of taste	Discuss types of taste sensations and their perception on tongue List factors affecting taste sensation Describe location and activation of taste buds Describe the gustatory pathway
5.	Sense of smell	Describe the location and activation of the olfactory receptors Discuss the primary sensations of smell Describe the olfactory pathway to brain Define the following - Anosmia - Hyposmia - Dyssomnia

6.	Classification & Mechanism of action of hormones	Classify hormones Discuss endocrine hormones Discuss the secretion, transport, clearance and mechanism of actions of different hormones Describe the hormone receptors and their activation Differentiate between endocrine and exocrine glands List the major endocrine glands and their locations
7.	Pituitary Gland & Hypothalamohypophyseal system	Describe the following structural and functional relationships of the hypothalamus-pituitary unit Discuss the control, site of action and functions of the adenohypophysis hormones Discuss the effects of hypo and hyper secretions of adenohypophysis hormones Correlate the function of the neurohypophysis and the hypothalamus
		Discuss the synthesis, secretions and effects of anterior and posterior pituitary hormones
8.	Growth Hormone	Release of growth hormone Factors effecting its release Functions of growth hormone Abnormalities in release of growth hormone secretion
9.	Thyroid hormones	Describe the formation, secretion, function and regulation of thyroid hormones Discuss disorders of thyroid hormones
10.	Pancreatic hormones	Discuss the following mode of action of insulin release Describe the functions of insulin, glucagon, somatostatin and pancreatic polypeptide.
11.	Calcium homeostasis-1	List the hormones that regulate the calcium and phosphate homeostasis
12.	Calcium homeostasis-2	Discuss the functions of parathyroid hormone, vitamin D and calcitonin Describe hypocalcemia and hypercalcemia
13.	Adrenal hormones 1 (Adrenal cortex)	Describe the site of formation, function and control of secretion of the following adrenal hormones: - Mineralocorticoids and - Glucocorticoids
14.	Adrenal hormones 2 (Adrenal Medulla)	Discuss Cushing syndrome, Cushing disease and Addison's disease
15.	Male sex hormones	Discuss hormones specific for male Structure and functions of male sex hormone
16.	Female sex hormones	Discuss hormones specific for female Structure and functions of female sex hormone
17.	Ovarian & Menstrual cycle	Describe ovarian and Menstrual cycle Different phases of ovarian and menstrual cycle Compare both cycles

COURSE TOPIC: DIGESTIVE & URINARY SYSTEM

S. No	LECTURE TOPIC	TOPIC OBJECTIVES
1.	Digestive system – Introduction	Describe the structural and functional organization of the digestive system. Discuss the physiological anatomy of Gastrointestinal tract. Discuss the characteristic features of GIT smooth muscle.
2.	Salivation & Salivary Gland	Describe the composition and functions of saliva. List the factors that increase salivary secretion. Discuss the nervous regulation of salivary secretion
3.	Mastication & Swallowing	Discuss the chewing and swallowing reflex. Describe the function of lower esophageal sphincter Discuss the mechanisms that prevent food from entering the nasal cavity and larynx during swallowing
4.	Stomach	List the functions of stomach Describe composition of gastric juice & their functions Discuss the phases of gastric secretory activity, gastric emptying and its regulation.
5.	Small intestine	Describe types of movement in small intestine Discuss the inhibition of motility and secretion in the stomach Discuss peristaltic rush and migrating motor complex. List structures that increase the absorptive surface area of the small intestine. Discuss the factors affecting the motility and secretion of food in the stomach. Describe the absorption of each type of nutrient in the small intestine.
6.	Liver & Gallbladder	Discuss the composition, formation, conduction and functions of Bile and Bile salts. Describe the functions and emptying of gallbladder.
7.	Pancreas	Describe the composition, function and role of pancreatic secretion. Discuss factors which affect the pancreatic secretion. Discuss the role of hormones in regulating pancreatic secretion.
8.	Large intestine, defecation reflex	Describe the structure, functions and major types of movements in large intestine. Discuss the defecation reflex. Discuss functions of internal and external anal sphincters.

9.	Gastrointestinal hormones	Discuss the secretion and role of following GIT hormones in digestion of food - Cholecystokinin - Secretin - GIP - Gastrin - Gastrin Releasing Peptide - Pancreatic Polypeptide - Somatostatin - Vasoactive Intestinal Polypeptide - Motilin
10	. Nervous and hormonal Regulation of GIT	Discuss the neural and hormonal control of GIT - Enteric Nervous System. Describe types of GIT reflexes Correlate the role of interstitial cells of Cajal with smooth muscle contractile activity. Contrast the effects of parasympathetic and sympathetic nervous activity in modulating GI activity.
11	. Kidney function & Nephron	Discuss the functional anatomy of kidney. Define Nephron and its types. Describe parts of a nephron Discuss the functions of kidney
12	. Glomerular filtration rate (GFR) & its Regulation	Define GFR State the normal range of GFR. Describe the glomerular filtration membrane and its function Discuss the forces that promote and oppose glomerular filtration. Discuss the significance of autoregulation of GFR Describe the regulation of glomerular filtration by hormones and the nervous system
13	. Tubular reabsorption	Discuss passive and active mechanism of transport for tubular reabsorption. Discuss reabsorption of fluid by peritubular capillaries Discuss tubular reabsorption along different parts of the nephron and its regulation. Define tubular load and Tubular transport maximum (Tm).
14	. Renal concentrating, diluting mechanism (Counter current mechanism)	Discuss: - Osmotic gradient - Counter Current Mechanism - Renal mechanisms for excreting diluted urine. - Role of anti-diuretic hormone & osmoreceptors
15	. Micturition reflex	Discuss the role of bladder in accommodating a wide range of urine volume Describe the neural reflex pathway that regulates emptying of bladder

16	. Hormones acting on kidney	Discuss the effect of following hormones on kidney - ADH - Aldosterone - Angiotensin II - ANP - PTH

COURSE TOPIC: Skin

1.	Structure & Functions of Skin	Structure of the Skin Types of cells in different layers Skin Functions Glands in skin Skin color Keratinization & Albinism
2.	Thermoregulation	Normal Body Temperature Core and Shell body temp. Ways of measuring Body Temp List the mechanisms of heat production & heat loss Regulation of Body Temp. Effect of Hot & Cold environment on the body.

BIOCHEMISTRY

COURSE CONTENT & OBJECTIVES

1. Cell
2. Carbohydrate
3. Lipid
4. Protein
5. Enzymes
6. Neuro-proteins
7. Hemoglobin
8. Vitamins & Minerals
9. Metabolism
10. Nutrition, Endocrinology & Metabolism

Practical List:

- Lab safety & hazards
- Solutions
- Normal saline preparations
- Detection of Carbohydrates
- Detection of Lipids
- Detection pf Proteins
- Normal Urine
- Abnormal Urine contents

COURSE TOPIC: BIOCHEMISTRY OF CELL

S. No	LECTURE TOPIC	TOPIC OBJECTIVES
1	Introduction to Biochemistry	Discuss importance of Biochemistry in Dentistry
1A	Introduction of Lab Safety procedures and equipment.	To be aware with: Lab safety procedures. Principle and operating procedures of lab equipment.
2	Cell- Biochemical Composition & Cell Organelles.	Describe the important micro and macro molecules found in the cell Discuss the major functions of organelles.
3	Cell Membrane	Explain the Biochemical structure and functions of cell membrane
4	Water	Explain the biochemical structure and properties of water
4A	Preparation of Solutions	Define solution, its types. Preparation of solutions of different concentrations
5	pH & Buffers	Define the following - Buffers - Acidosis - Alkalosis Explain the types and mechanisms of action of the following: - Buffers - Acidosis - Alkalosis

COURSE TOPIC: 2. CARBOHYDRATE CHEMISTRY

S. No	LECTURE TOPIC	TOPIC OBJECTIVES
1	Introduction of Carbohydrates	Define and classify carbohydrates Discuss sources and biomedical importance of carbohydrates

2	Monosaccharides Disaccharides and Oligo saccharides	Define and classify the following - Monosaccharides - Disaccharides - Oligosaccharides Describe isomerism in monosaccharides Explain the biomedical importance of the following - Monosaccharides - Disaccharides - Oligosaccharides
3	Polysaccharides	Define and classify Polysaccharides Explain functions of different types of polysaccharides
3A	Detection of CHO (Scheme)	Define principle and procedure for CHO detection methods. Identify and differentiate sugars-non-sugars, reducing-non reducing sugars and monosaccharide-polysaccharides in any sample/solution.

COURSE TOPIC: 3. LIPID CHEMISTRY

S. No	**LECTURE TOPIC**	**TOPIC OBJECTIVES**
1	Introduction of Lipids & Lipid Peroxidation	Define and classify lipids Discuss the functions of lipids and biomedical importance of lipids
2	Fatty Acids & Eicosanoids & Derived Lipids	Define and classify fatty acids Explain the properties, functions and nutritional importance of fatty acids
3	Compound Lipids & Cholesterol	Classify the functions and biomedical properties of each type of lipid (PL, LP, GL, sphingolipid) Discuss the functions and biomedical importance of each type of lipid
	Emulsification Test	Define hydrophobic nature of fats. To identify hydrophobic and hydrophilic solutions.

COURSE TOPIC:4. PROTEIN CHEMISTRY

S. No	LECTURE TOPIC	TOPIC OBJECTIVES
1	Amino Acids	Describe the properties, functions and chemical reactions of amino acids
1A	Techniques for identification and separation of Amino Acids (Chromatography, Centrifugation, Salting out.)	- Define Polar and non-polar amino acids - Describe the principle and procedure for techniques used for identification of amino acids.
2	Introduction of Protein, Protein Structure & Collagen & Elastin	Explain the structure, function & biomedical importance of proteins
3	Plasma Proteins & Immunoglobulins	Define and classify simple proteins (plasma proteins) Discuss biomedical importance of simple proteins
3A	Detection of Protein (Scheme)	To detect the protein in any sample/solution.
3B	Separation of Proteins (Electrophoresis)	- To describe Ionic character of proteins. - Define principle and procedure of electrophoresis
4	Extra Cellular Matrix	Disorders CHO & Proteins

COURSE TOPIC: 5. ENZYMES

S. No	Lecture Topic	Topic Objectives
1	Introduction of Enzymes& Mechanism of Action of Enzymes	Define and classify enzymes Explain the structure of enzymes Discuss the mechanism of action of enzymes Describe the MM equation
2	Factors & Inhibitors	Discuss the factors that regulate enzyme activity
2A	Effect of Temperature and pH on enzyme action	- Define Enzyme activity. - Discuss effect of temperature and pH on enzyme activity.
3	Clinical Enzymology	Discuss the clinical importance of enzymes in diagnosis

COURSE TOPIC: 6. HEMOGLOBIN CHEMISTRY

S, No	LECTURE TOPIC	TOPIC OBJECTIVES
1	Heme-Structure	Discuss structure, functions, & types of hemoglobin
2	Heme-Synthesis & Porphyria	Explain heme synthesis Discuss disorders of heme synthesis
3	Hemoglobinopathies	Discuss the types, biochemical defects & clinical manifestation of hemolytic anemia (Thalassemia, Sickle cell Anemia.)
4	Heme- Degradation & Jaundice	Discuss synthesis, types and fate of bilirubin Classify: - Jaundice - LFTs
4A	Detection of Bile salt & Bile pigments	To detect the bile salts and bile pigments in given solution.
4B	Interpretation of LFT	- Define Principle and procedures for estimation of liver enzymes. Normal and abnormal values of liver enzymes. - Discuss the abnormalities of bile pigments and liver enzyme in relation to jaundice & other abnormalities.

COURSE TOPIC: 7. VITAMINS

S. No	LECTURE TOPIC	TOPIC OBJECTIVES
1	Vitamin A, E & K	Introduction & Classification, Discuss the structure, functions, RDA, sources and deficiency Manifestations of the following: - Vitamin A, E and K - Vitamin D - Vitamin C - Vitamin B12 and folic acids - Vitamin B1, B2, B3 and B6
2	Vitamin D	
3	Vitamin C	
4	Vitamin B12 & Folic Acids	
5	Vitamin B1, B2, B3 & B6	

COURSE TOPIC: 8. MINERALS

S. No	LECTURE TOPIC	TOPIC OBJECTIVES
1	Iron	Discuss the functions, RDA, sources, transport, storage, biochemical role & clinical importance of: - Sodium - Chloride - Iron - Calcium - Phosphorous - Fluoride - Other minerals.
2	Calcium, Phosphorus	
3	Fluoride & Other Minerals	
	Detection of Abnormal Urine	Enlist the abnormal contents of urine. To correlate the abnormal constituents of urine with the clinical condition.

COURSE TOPIC: 9. Genetics

S. No	LECTURE TOPIC	TOPIC OBJECTIVES
1	Nucleotides	Define nucleoproteins Discuss the chemical structure & significance of nucleoproteins
2	DNA & RNA	Describe the chemical structure, properties and functions of DNA & RNA
2A	Determination of Uric Acid	Define Normal value of uric acid. To correlate the abnormal value of uric acid with the disease.
3	Central Dogma of Molecular Biology	Discuss the central dogma of molecular biology
4	DNA Replication	
5	Nucleic Acid	Metabolism Brief
6	Transcription & Post transcriptional modification	Describe the steps of transcription and its enzymes
7	Translation & Post transcriptional modification	Describe the steps of translation and its enzymes
8	Protein synthesis and gene expression	Describe protein synthesis Discuss the role of protein

COURSE TOPIC: 10. CARBOHYDRATE METABOLISM

S. No	LECTURE TOPIC	TOPIC OBJECTIVES
1	Digestion & Absorption of Carbohydrates	Describe the breakdown of complex dietary carbohydrates to simple sugars Discuss the absorption of simple sugars from GIT into portal blood
2	Glycolysis	Define glycolysis Explain the reactions involved in glycolytic pathway Discuss the fate of pyruvate formed from glucose
3	TCA	Explain the reactions & the regulation of citric acid cycle.
4	Gluconeogenesis	Define gluconeogenesis. Discuss the process of gluconeogenesis.
5	Glycogen Metabolism	Describe the formation, break down and regulation of glycogen
6	HMP	Describe purpose, importance & reactions of Hexose Monophosphate Pathway
7	Regulation of Blood Glucose &Diabetes Mellitus	State the range of normal blood glucose level. Discuss the clinical significance of variations in blood glucose level and metabolic derangements that occur in Diabetes Mellitus.

COURSE TOPIC: 11. LIPID METABOLISM

S. No	LECTURE TOPIC	TOPIC OBJECTIVES
1	Digestion & Absorption of Lipids	Describe the breakdown of complex dietary lipids into simpler forms. Discuss the absorption of simpler forms of dietary lipids from GIT.
2	Cholesterol & Lipid Transport (Lipoproteins)	Discuss the chemistry, metabolism and associated clinical disorders of lipoproteins.
3	β Oxidation	Explain the oxidation of fatty acid
4	Ketone Bodies	Explain the synthesis & utilization of Ketone Bodies

COURSE TOPIC: 12. ELECTRON TRANSPORT CHAIN

S. No	LECTURE TOPIC	TOPIC OBJECTIVES
1	Electron Transport Chain	Discuss the structure & functions of Electron Transport Chain Describe the synthesis of ATP

COURSE TOPIC: 13. PROTEIN METABOLISM

S. No	LECTURE TOPIC	TOPIC OBJECTIVES
1	Digestion & Absorption of Proteins	Describe the breakdown of dietary proteins into simpler forms Discuss the absorption of simpler forms of dietary proteins from GIT
2	Reactions of Amino acids & Urea Cycle and NH3 Toxicity	Explain the reactions of amino acids Describe the ammonia metabolism
3	Phenylalanine, Tyrosine & Tryptophan Metabolism	Discuss the metabolism and inborn errors of specific amino acids

COURSE TOPIC: 14. ENDOCRINOLOGY

S. No	Lecture Topic	Topic Objectives
1	Introduction of Hormones	Define hormones Classify hormones Discuss the general characteristic of different types of hormones Explain the chemistry, mechanism of action & metabolic role of hormones released by the following structures - Hypothalamus - Pituitary gland - Thyroid gland - Adrenal glands - Pancreas
2	Hypothalamus, Pituitary & Thyroid	
3	Adrenal& Pancreatic Hormones	

ORAL BIOLOGY

COURSE CONTENT & OBJECTIVES

1. Introduction to structures
2. Vasculature & innervation of the mouth
3. Embryology of head, face and oral cavity
4. Development of tooth & supporting structures
5. Enamel & Amelogenesis
6. Dentin & Dentinogenesis
7. Dental pulp & its development
8. Periodontium
9. Physiologic tooth movement
10. Salivary glands
11. Oral mucosa
12. Temporo-mandibular joint
13. Ageing in the oral cavity
14. Dental anatomy
15. Identification of teeth
16. Pulp Chambers & Canals
17. Occlusion
18. Forensic dental anatomy

COURSE TOPIC: INTRODUCTION TO STRUCTURES OF ORAL TISSUES

S. No	LECTURE TOPIC	TOPIC OBJECTIVES
1	Introduction to oral biology & structure of tooth	Discuss the clinical application of oral biology List all structures of a tooth with their clinical relevance Identify structures of a tooth on models ,radiographs and in the oral cavity
2.	Appearance of the oral cavity	List the correct and appropriate anatomical and dental terminologies to describe accurately all the visible features present in the mouth Identify the supporting structures of a tooth on pictures/ models. Differentiate among the various supporting structures of a tooth Relate the functional significance of lip posture and of producing an anterior oral seal Appreciate the clinical significance of normal and abnormal lip postures Perform basic dental charting and record dental findings Demonstrate basic dental history taking skills Perform basic extra-oral & intra-oral exam
3.	Age changes & clinical relevance of the structure of tooth	Appreciate that clinical situations in the mouth may be related to normal variation, or disorders that highlight normal features that may otherwise be inconspicuous, or be common benign disorders, or less common severe (possibly life-threatening) disorders. Discuss the clinical relevance of the following structures - Enamel - Dentine - Cementum - Periodontal ligament Discuss age-related changes of the following structures - Enamel - Dentine - Cementum - Periodontal ligament
4.	Dento-osseous structures	Describe the anatomical features of the bones that comprise the jaws (mandible and maxillae)

COURSE TOPIC: THE VASCULATURE AND INNERVATION OF THE MOUTH

S. No	LECTURE TOPIC	TOPIC OBJECTIVES
1	Vasculature of the mouth	Describe the sources and distribution of blood vessels supplying the mouth and associated structures (i.e., the teeth and their supporting structures, the salivary glands, the tongue, palate, floor of mouth, lips, and cheeks).
2.	Innervation of the mouth	Describe the sources and distribution of nerves supplying the mouth and associated structures (i.e., the teeth and their supporting structures, the salivary glands, the tongue, palate, floor of mouth, lips, and cheeks)
3.	Trigeminal nerve & its divisions	Describe the courses and distribution of the maxillary and mandibular divisions of the trigeminal nerve

4.	Lymph nodes & tonsillar ring	Describe the location of the major groups of lymph nodes draining oro-dental tissues Describe the tonsillar ring protecting the entrance to the pharynx
5.	Clinical considerations of the innervation of the mouth	Relate the inferior alveolar nerve block with its anatomy

COURSE TOPIC: EMBRYOLOGY OF HEAD FACE AND ORAL CAVITY

S. No	LECTURE TOPIC	TOPIC OBJECTIVES
1	Neural Crest Cells and Head Formation, Branchial (Pharyngeal) Arches and Primitive Mouth	List the: - Derivatives of Pharyngeal Arches - Derivatives of pharyngeal pouches - Types of teratogens Explain the development of the following structures of the embryo - Head - Face - Palate - Tongue - Skull - Maxilla - Mandible - Temporomandibular joint Describe the mesenchymal facial processes around the developing mouth (stomodeum) Describe the timing of facial development Relate how these facial processes contribute to the formation of the upper and lower lip regions Differentiate between the following processes - Intramembranous and cartilaginous ossification - Development of maxilla and mandible Relate how disturbances in normal facial development can result in common congenital abnormalities (e.g., clefts of the lip). Enlist the timescale of events during palatogenesis Compare the differences between the developments of the primary and secondary palates Describe the mechanisms (both molecular and cellular) underpinning elevation (reorientation) of the palatal shelves Explain the events associated with fusion of the palatal shelves following shelf elevation Describe: - The prenatal development of the mandible - The postnatal development of the mandible - The prenatal development of the maxillae - The postnatal development of the maxillae - The prenatal development of the TMJ
2	Formation of Face and Secondary Palate	
3	Formation of Tongue	
4	Development of Skull	
5	Development of Mandible and Maxilla	
6	Development of Temporomandibular Joint	
7	Congenital Defects	

		- The postnatal development of the TMJ
		Relate how the development of the jaws relates to the development of the skull Describe the development of both the anterior two thirds and the posterior third of the tongue Relate the development of the tongue to the innervation of the tongue once fully formed

COURSE TOPIC: DEVELOPMENT OF THE TOOTH AND ITS SUPPORTING TISSUES

S. No	LECTURE TOPIC	TOPIC OBJECTIVES
1	Stages of tooth development	Discuss the development of: - Primary epithelial band - Dental lamina
2	Tooth Type Determination	

3	Hard Tissue Formation & Root Formation	- Vestibular lamina - Hard tissues of tooth - Root Differentiate among/between the following - All stages of tooth development - Single and multi-rooted tooth development Describe the origin and fate of the primary epithelial band, the vestibular band and the dental lamina Describe the development of the tooth germ from its initial appearance at the dental lamina through to the bell stage of development and just at the point of initiation of dentine and enamel formation Relate how the description of early tooth development links with events of histogenesis and morphogenesis Describe the complexity of ectodermal–mesenchymal interactions during tooth development Discuss the mechanisms controlling tooth type and shape Enlist the range of congenital malformations affecting tooth development

COURSE TOPIC: DENTAL ENAMEL & AMELOGENESIS

S. No	LECTURE TOPIC	TOPIC OBJECTIVES
1	Introduction to enamel	Describe the inorganic and organic composition of enamel Describe the physical properties of enamel and histological features of enamel. Describe the characteristics of enamel crystallites and their changing orientation Relate how the structure of enamel can withstand the forces of mastication Describe the concept of an enamel prism and its appearance in different planes of enamel Discuss the significance of the term “prism-less” enamel and where it is found The directions of enamel prisms and the appearance of Hunter-Schreger bands
2	Stages of Amelogenesis& Mineralization	
3.	Structural, Organizational Features of Enamel	

		The nature of cross-striations, enamel striae and other incremental markings in enamel Differentiate between enamel spindles, enamel tubules, and enamel lamellae Recognize the features of enamel that are pertinent to the progress of dental caries Visualize & locate dental caries Differentiate among the stages of Amelogenesis. Appraise the importance of epithelial/mesenchymal interactions during amelogenesis Categorize the changes in morphology during the ameloblast life cycle to its changing function Restate the significance of the Tomes process in terms of prism formation Compare the composition of young enamel, particularly in terms of the organic matrix Describe the changes that take place during enamel maturation Describe the incremental nature of amelogenesis State the disorders that can occur during enamel formation and how they present clinically. Compare and contrast amelogenesis and Dentinogenesis Appraise how the current knowledge of enamel structure and biology relates to the design of dental restorations Appraise why a knowledge of enamel structure (in particular the enamel surface) and age changes are important in the clinic.
4.	Investing organic layers on enamel surfaces.	Explain the origins of the acquired pellicle Describe the mechanisms of attachment of bacteria and proteins to the acquired pellicle leading to plaque formation Appraise how different dietary carbohydrates influence plaque matrix and how that matrix affects cariogenicity Describe the formation of dental calculus

COURSE TOPIC: DENTIN & DENTINOGENESIS

S. No	LECTURE TOPIC	TOPIC OBJECTIVES
1	Introduction, types, dentine formation	Describe the chemical composition of dentine Describe the physical properties of dentine
2	Histology of Dentin	
3	Dentinogenesis	

4	Theories of Dentin Sensitivity	Relate the structure of dentine in terms of the appearance and arrangement of the dentinal tubules and their contents Compare intertubular and peritubular dentine Compare and contrast dentin with enamel, cementum, and bone Compare the different zones in dentine and the reasons for these differences Describe the structural and incremental lines in dentine Enlist the functions of dentine and how these relate to its structure Describe the basis of dentine sensitivity Describe the changes in dentine that take place with age (including secondary dentine) Relate how dentine reacts to trauma and other pathological insults Appraise the clinical implications related to dentine permeability
		Relate how dentine bonds to restorative materials The clinical aspects of dentine resorption Analyze how the processes involved in the development of dentine compare with those involved during the formation of enamel Describe the development of the odontoblast Appraise how Dentinogenesis is initiated by epithelial–mesenchymal interactions Relate how dentine matrix is laid down and subsequently mineralized Describe the process of heterogeneous nucleation and the role of Dentin phosphoprotein Relate the structures seen in fully formed dentine with the development of the tissue Compare & contrast the developmental differences between primary, secondary, and tertiary dentine Compare the developmental differences between intertubular and peritubular dentine State the stem cell developments that might lead to regeneration of pulpodentinal tissues

COURSE TOPIC: DENTAL PULP & ITS DEVELOPMENT

	TOPIC	TOPIC OBJECTIVES
1.	Dental pulp, its composition	Describe the composition of the dental pulps Recognize the structure of the dental pulp, including all its cell types Describe the stem cells within the pulp and relate their clinical significance Appraise how the dental pulp compares with other soft connective tissues and awareness of specializations that may relate to its position, being surrounded by dentine Describe the blood vessels of the pulp Describe the nerves of the pulp and the physiology of dental pain Analyze the regional differences within the pulp Appraise the age changes that occur in the dental pulp and how these may relate to clinical situations.
2.	Development of the dental pulp	Suggest best practice to ensure the safety of the pulp during treatment of the tooth State the origin of the dental papilla and of the tissues derived from the papilla Analyze the relationship between the development of dentine and the dental pulp Appraise the epithelial–mesenchymal interactions that lead to dental pulp formation Appraise the embryonic-like features of the dental pulp and why there are stem cells there Relate the development of the neurovascular elements within the dental pulp.
3.	Age Changes in pulp	Analyze age changes in the dental pulp as part of its normal development

COURSE TOPIC: PERIODONTIUM

S. No	LECTURE TOPIC	TOPIC OBJECTIVES
1	Introduction to periodontium.	Define periodontium. List the components of periodontium.
2	Cementum formation & Types of cementum	Classify cementum. Discuss the formation and biochemical composition of cementum. Describe the composition of cementum Discuss the physical properties of cementum Enlist the main structural features of cementum Relate the various types of cementum and the associated classification of the tissue Appraise the importance of the cementum–enamel and cementum–dentinal junctions Analyze comparisons between cementum and bone

3	Alveolar bone	Describe the structure of alveolar bone. Identify the histological features of alveolar bone on pictures. Describe the composition of alveolar bone Classify alveolar bone Enlist the main structural features of alveolar bone Describe the structure and origin of the various cell types seen in alveolar bone. Relate how the structure of different bone cells is related to their function. Analyze the complexity of factors involved in bone formation and resorption and how the two processes are coupled. Appraise why a knowledge of bone is necessary to appreciate how it impinges on tooth replacement by an implant Analyze why a knowledge of bone is necessary to appreciate how it impinges on the healing of fractures Appraise why a knowledge of bone is necessary to appreciate how it impinges on healing of tooth extraction sockets
4	Periodontal Ligaments	Classify the periodontal ligaments. Discuss the cells of periodontal ligament space. Enlist the features that characterize the tissue as a non-mineralized connective tissue Describe the composition of the collagenous components of the periodontal ligament & extracellular matrix Compare the arrangement of the principal collagen bundles and their fibrils, including the orientations and names of the principal bundles Describe the mode of attachment of the periodontal fibers into the tooth and bone Analyze the features of the periodontal vasculature Appraise the features of the innervation, particularly mechanoreceptor activity Appraise the functions of the periodontal and how these functions relate to structure Appraise the different theories relating to the tooth support mechanism

COURSE TOPIC: PHYSIOLOGIC TOOTH MOVEMENT: ERUPTION AND SHEDDING

S. No	LECTURE TOPIC	TOPIC OBJECTIVES
1	Pre-eruptive & Eruptive Tooth Movement	Describe the events that take place around the tooth as it erupts from its developmental position and into its functional position Discuss the different theories of the tooth eruptive mechanism Describe the following types of tooth movements: - Pre-eruptive - Post-eruptive - Abnormal - Orthodontic Discuss shedding of teeth. Describe the reduced enamel epithelium and its contribution to the development of the junctional epithelium Enlist the stages in the eruption of the permanent teeth that lead to resorption of overlying deciduous teeth Describe the mechanisms responsible for the resorption of deciduous teeth, including signaling events promoting resorption by multinuclear (osteoclastlike) cells Appraise the variety of clinical conditions that affect the development of the dentition, including disorders influencing eruption.
2	Post-eruptive & Abnormal Tooth Movement	
3	Shedding of Teeth	

COURSE TOPIC: SALIVARY GLANDS

S. No	LECTURE TOPIC	TOPIC OBJECTIVES
1	Anatomy, development & functions of salivary glands	Describe the anatomy of salivary glands Compare the positions and relations of the three major salivary glands and their ducts Enlist the origin of the parasympathetic nerve supplies of the major salivary glands
2	Histology of Major & Minor Salivary Glands	

3	Clinical Considerations	Discuss the composition of saliva List age-related changes in salivary glands Relate the composition of saliva with its functions Recognize the process of formation of saliva List the main components and functions of saliva Know how the secretion of saliva is controlled Describe the gross anatomy and relationships of the major salivary glands and the situation of the groups of minor salivary glands Understand the histology of the salivary glands both in terms of the parenchymal cells (mucous and serous) and the nature of the duct system, and be able to appreciate the differences between the three pairs of major salivary glands Describe the structure and possible function of the myoepithelial cells appreciate how the composition of saliva is modified from its formation in the acini until it passes into the oral cavity at the main opening of the gland transfer knowledge of the structure and function of the salivary glands into understanding clinical situations such as xerostomia.

COURSE TOPIC: ORAL MUCOSA

S. No	LECTURE TOPIC	TOPIC OBJECTIVES
1	Definition, Boundaries & Functions of Oral Mucosa	Define oral mucosa Describe the boundaries of oral cavity Explain the structure of oral mucosa Relate the structure of oral mucosa with its functions

2	Oral mucosa, Oral Epithelium & Lamina Propria.	Classify different types of oral mucosa Differentiate between different types of oral mucosa on the basis of histology Describe the cells of epithelium & connective tissue. Enlist the constituent layers of the oral epithelium in different regions of the mouth and how structure and function are related. Compare the various types of keratocytes in the oral mucosa Differentiate the various types of non-keratocytes in the oral mucosa Relate the significance of the term gustatory epithelium. Describe the structure of the basement membrane. Appraise the significance of the basement membrane in tumor spread. The differences in the form of the lamina propria between masticatory and lining mucosa. Enumerate the constituents of the submucosa and where it is present in the mouth Describe the distribution of salivary glands within the oral mucosa Differentiate between free gingiva, attached gingiva, crevicular epithelium, and junctional epithelium. Appraise the uniqueness of the junctional epithelium and the underlying lamina propria, relating its structure to its function. Analyze the origin and composition of the gingival crevicular fluid and its primary role in health. Relate how inflammation influences gingival crevicular fluid composition and production Describe how proteins within the crevicular fluid act as biomarkers of disease progression Describe the types of oral mucosa lining the surface of the tongue, the different papillae and the distribution of taste buds.
3	Clinical variations & Age Changes in oral mucosa	Describe the clinical variations & age changes within the oral mucosa Analyze why appreciation of the normal appearance of the oral mucosa is essential in obtaining a diagnosis for the many pathological conditions seen within the oral cavity.

COURSE TOPIC: TEMPOROMANDIBULAR JOINT

S. No	LECTURE TOPIC	TOPIC OBJECTIVES
1	Regional topography of the mouth and related areas and the TMJ	Classify joints List examples of each type of joint Differentiate the macroscopic and microscopic structure of a joint List the components of the temporomandibular joint, including the ligaments, muscles, the intraarticular disc, and the insertion of the lateral pterygoid muscle To classify TMJ and relate its anatomy and physiology to its biomechanics To link form with function of TMJ in health & disease including trauma Describe the Innervations and blood supply of temporomandibular joint. Relate the muscle attachments with movement of TMJ joint Enlist and relate the functions of the intra-articular disc of the TMJ with its anatomy Compare and contrast the TMJ with most other synovial joints List the main components of synovial fluid How synovial fluid might change with joint dysfunction. Appraise the multifactorial nature of temporomandibular joint disease and the symptoms it may present with Discuss the locations, attachments, functions, and innervations of the muscles influencing mandibular movements, lip movements & cheek movements, Discuss tongue & floor of the mouth movements & soft palate movements. Describe the location, major content and clinical importance of the infratemporal and pterygopalatine fossae Relate the locations and clinical significance of the tissue spaces around the jaws.

COURSE TOPIC: AGEING AND ARCHAEOLOGICAL AND DENTAL ANTHROPOLOGICAL APPLICATIONS OF TOOTH STRUCTURE

S. No	LECTURE TOPIC	TOPIC OBJECTIVES
1	Effects of Aging in the oral cavity	Appraise the main age changes that occur in the orodental Tissues Analyze how age changes affect the treatment of young, as compared with old, patients.

COURSE TOPIC: INTRODUCTION TO DENTAL ANATOMY

S. No	LECTURE TOPIC	TOPIC OBJECTIVES

1	Introduction to Dental Anatomy	Describe the following - Clinical application of oral biology/dental anatomy - Importance of oral biology/dental anatomy - Primary, transitional & permanent dentition periods - Tooth numbering systems - Surfaces and landmarks of teeth - Positive & Negative landmarks of teeth Division into Thirds, Line Angles, and Point Angles Identify the following on models/ pictures: - Primary, transitional & permanent dentition periods
		- Teeth based on various tooth notation systems on models - Surfaces and landmarks of teeth on Models

COURSE TOPIC: DEVELOPMENT AND ERUPTION OF THE TEETH

S. No	LECTURE TOPIC	TOPIC OBJECTIVES
1	Development and Eruption of Primary & permanent teeth	Describe the pattern & age of eruption of primary & permanent teeth Chronologies of the permanent and primary dentition Estimate the dental age of an individual

COURSE TOPIC: THE PRIMARY (DECIDUOUS) TEETH

S. No	LECTURE TOPIC	TOPIC OBJECTIVES
1	Maxillary Central & Lateral Incisor	Identify all deciduous teeth on models. Differentiate between primary and permanent teeth. Explain the landmarks of all deciduous teeth. Appraise the Importance of Primary Teeth Compare & contrast primary and Permanent Teeth Describe the endodontic anatomy of all deciduous teeth.
2	Mandibular Central & Lateral Incisor	
3	Maxillary & Mandibular Canine	
4	Maxillary First & Second Molar	
5	Mandibular First & Second Molar	

COURSE TOPIC: OROFACIAL COMPLEX: FORM AND FUNCTION

S. No	LECTURE TOPIC	TOPIC OBJECTIVES
1	Physiological Form of Teeth and Periodontium	Describe the physiological form of the teeth and periodontium Describe the facial and Lingual Aspects of All Teeth Summarize the schematic Outlines of teeth and dental arches Relate the Form and Function of the Permanent Dentition Describe the Alignment, Contacts, and Occlusion of dentitions Locate curve of Spee, curve of Wilson & plane of occlusion (Curve of Monson) in the dentition.

2	Contact Areas, Interproximal Spaces	Describe contact areas, interproximal spaces & embrasures Identify contact areas , interproximal spaces & embrasures on models/ pictures. Relate the Height of Epithelial Attachment with the Curvatures of the Cervical Lines (Cementoenamel Junction [CEJ]) Mesially and Distally

COURSE TOPIC: THE PERMANENT MAXILLARY INCISORS

S. No	LECTURE TOPIC	TOPIC OBJECTIVES
1	Maxillary Central Incisor	Identify maxillary incisors on models/ pictures. Describe the landmarks and endodontic anatomy of maxillary incisors Compare maxillary central and lateral incisors with regard to their macroscopic structure
2	Maxillary Lateral Incisors	

COURSE TOPIC: THE PERMANENT MANDIBULAR INCISORS

S. No	LECTURE TOPIC	TOPIC OBJECTIVES
1	Mandibular Central Incisor	Identify mandibular incisors on models/ pictures. Describe the landmarks and endodontic anatomy of these teeth Compare mandibular central and lateral incisors with regard to their macroscopic structure
2	Mandibular Lateral Incisor	

COURSE TOPIC: THE PERMANENT CANINES: MAXILLARY AND MANDIBULAR

S. No	LECTURE TOPIC	TOPIC OBJECTIVES
1	Maxillary Canine	Identify canines on models/ pictures. Describe the landmarks and endodontic anatomy of these teeth compare maxillary and mandibular canines regarding their macroscopic structure
2	Mandibular Canine	

COURSE TOPIC: THE PERMANENT MAXILLARY PREMOLARS

S. No	LECTURE TOPIC	TOPIC OBJECTIVES
1	Maxillary First Premolar	Identify maxillary premolars on models/ pictures. Describe the landmarks and endodontic anatomy of these teeth compare maxillary first and second premolars regarding their macroscopic structure
2	Maxillary second premolar	

COURSE TOPIC: THE PERMANENT MANDIBULAR PREMOLARS

S. No	LECTURE TOPIC	TOPIC OBJECTIVES
1	Mandibular First Premolar	Identify mandibular premolars on models/ pictures. Describe the landmarks and endodontic anatomy of these teeth Compare mandibular first and second premolars with regard to their macroscopic structure
2	Mandibular Second Premolar	

COURSE TOPIC: THE PERMANENT MAXILLARY MOLARS

S. No	LECTURE TOPIC	TOPIC OBJECTIVES
1	Maxillary First Molar	Identify maxillary molars on models/ pictures. Describe the landmarks and endodontic anatomy of these teeth Compare maxillary first, second and third molars with regard to their macroscopic structure
2	Maxillary Second Molar	
3	Maxillary Third Molar	

COURSE TOPIC: THE PERMANENT MANDIBULAR MOLARS- FIRST, SECOND AND THIRD

S. No	LECTURE TOPIC	TOPIC OBJECTIVES
1	Mandibular First Molar	Identify mandibular molars on models/ pictures. Describe the landmarks and endodontic anatomy of these teeth Compare mandibular first, second and third molars with regard to their macroscopic structure
2	Mandibular Second Molar	
3	Mandibular Third Molar	

COURSE TOPIC: IDENTIFICATION OF TEETH

S.NO	TOPIC	TOPIC OBJECTIVES
1.	Identification of teeth	Appraise how to identify precisely a tooth from either the permanent or deciduous dentition (excepting the variable permanent third molar teeth)
	Variation in tooth morphology	Describe the common dental anomalies associated with tooth morphology

COURSE TOPIC: PULP CHAMBERS & CANALS

S. No	LECTURE TOPIC	TOPIC OBJECTIVES
1	Pulp chambers of permanent teeth	Describe and identify pulp, Chamber, and Canals Enlist root canal configurations (Vertucci configuration) Analyze radiographic pulpal anatomy Demarcate Pulp Cavity and Canal Identify Pulp Horns Appraise the Clinical Applications of pulpal & root canal morphology Locate access cavity preparation of all teeth for endodontics Describe the typical pulp morphologies for each tooth Describe Pulp Cavities of the Maxillary & Mandibular Teeth
2	Clinical applications of pulpal anatomy	

COURSE TOPIC: OCCLUSION

S. No	LECTURE TOPIC	TOPIC OBJECTIVES
1	Basics of Primary Occlusion	Discuss occlusion in primary and permanent dentitions Describe the concepts of Occlusion

2	Basics of Permanent Occlusion	Difference between Centric relation & Centric Occlusion Enlist characteristics of an Ideal Occlusion Define Anterior guidance, Canine guidance, Cuspid rise Explain development of the Dentitions Appraise Cusp, Fossa, and Marginal Ridge Relations in occlusion Locate Centric spots, functional & non-functional cusps Discuss lateral Occlusal Relations Analyze the relationships of permanent teeth within the dental arches Aesthetics, smile , and the alignment and occlusion of teeth Enumerate the characteristics of normal (anatomical) centric occlusal position Classify malocclusions in terms of Angle's classification Classify malocclusions in terms of the incisor relationship Identify the major anatomical features seen on both extra-oral and intra-oral radiographs of the skull, jaws, and teeth

COURSE TOPIC: FORENSICS DENTAL ANATOMY

S. No	LECTURE TOPIC	TOPIC OBJECTIVES
1	Introduction & application of Forensic Dentistry	Define forensic dentistry Describe the methods of identification of unidentified individuals Discuss the application of forensic dentistry