

STUDY GUIDE INTEGRATED 2026
1ST YEAR BDS
BLOCK II



LAHORE
MEDICAL & DENTAL
COLLEGE

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STUDY GUID INTRODUCTION

What is a **study guide**?

The study guide is an important academic tool that aids students for different educational activities they are engaged in. It provides pertinent details on the module's structure, assisting students in planning their academic activities accordingly. Another purpose of study guide is to guide students about different rules and regulations as well as teaching and assessment techniques.

Purpose of study guide:

- Conveys details about the organization and management of the module.
- Helps the learners about departmental representatives who can be contacted in case of difficulty.
- Define the learning objectives that should be accomplished by the end of the module.
- Identifies learning methodologies such as lectures, small group discussion, practical that will be implemented during the module.
- Provide a list of learning resource to maximize their learning
- Includes information on the assessment methods and examination related rules and regulations

Time Allocation and Academic Framework

The First Professional BDS academic year consists of a minimum of 1,200 teaching hours, conducted in affiliated colleges. The curriculum is structured into three blocks, each further divided into modules with defined learning outcomes for each subject.

ANATOMY

THEORY			
GROSS ANATOMY			
CODE	SPECIFIC LEARNING OUTCOMES	TOPIC	Snells Clinical Anatomy by Regions 12 th Ed. (2026-27)
CF2-A- 001	List the layers of the scalp and describe their anatomical features, including neurovascular supply and lymphatic drainage.	Scalp	Pg 640-645
	Give anatomical justification of spread of scalp infections, profuse bleeding in superficial scalp lacerations, gaping of scalp wounds		
	Define the routes of spread of infection from scalp to brain		
CF2-A- 002	Enlist in tabulated manner the muscles of facial expression, giving their nerve supply and actions.	Face	Pg 645-650
	Describe the extracranial course, branches, and distribution of the facial nerve.		
	Explain the causes and clinical consequences of damage to the nerve.		
	Describe the vascular supply and lymphatic supply of face.		
	Describe the danger area of face with its clinical significance.		
	Define the routes of spread of infection from face to brain		
CF2-A- 003	Define the boundaries and openings of orbital cavity.	Eye	Pg 669-683
	List the structures traversing these openings.		
	In a tabulated manner enlist the extraocular and intraocular muscles of eyeball and eyelid muscles giving their nerve supply and actions		
	List and define the movements of eyeball with special reference to the axis		
	List the parts of Lacrimal apparatus giving their location and anatomical features. Describe the nerve supply of lacrimal gland		
	Describe the extracranial course, distribution and branches of oculomotor, trochlear and abducent nerves. Describe the location, roots and distribution of ciliary ganglion		
	Give the clinical correlates of nerves supplying the muscles of the eyeball		
	Describe the course and branches of ophthalmic artery mentioning its origin and termination		
	Give the anatomical structure of eyeball emphasizing on its		

	three coats and their neurovascular supply (including optic nerve and central retinal vessels).		
CF2-A- 004	Describe the boundaries contents and primary communications of temporal, infratemporal and pterygopalatine fossa	Temporal, Infratemporal and Pterygopalatine fossa	Pg 684-687
	Describe the location, roots and distribution of pterygopalatine ganglion		
CF2-A- 005	Describe the anatomical features and neurovascular supply of external ear	Ear	Pg 724-733
	Describe the boundaries, contents, neurovascular supply and communications of middle ear cavity		
	Describe the anatomical features of auditory tube.		
	Describe the parts, anatomical features and neurovascular supply of internal ear		
	Describe the course and distribution of vestibulocochlear nerve		
CF2-A- 006	Describe the anatomical features and neurovascular supply of external nose	Nose	Pg 753-758
	Describe the boundaries of nasal cavity (nasal septum, lateral wall, roof and floor) with their anatomical features, olfactory and trigeminal nerve supply, and vascular supply.		
	Discuss the clinical correlates of nose: Epistaxis, Foreign body in the nose.		
CF2-A- 007	Identify the paranasal sinuses (maxillary, frontal, ethmoidal, sphenoidal) and describe their location, neurovascular supply, relations, and drainage pathways.	Sinuses	
	Explain the lining and basic functions of the paranasal sinuses.		
	Relate the maxillary sinus to posterior maxillary teeth and discuss its clinical importance in dentistry (e.g., extractions, implants, sinus lift).		
	Discuss the clinical features of sinusitis and its differentiation from odontogenic pain.		
CF2-A- 008	Classify fractures of the maxilla based on anatomical patterns (Le Fort classification)	Fractures	Pg 632-634
	Classify fractures of the mandible based on anatomical regions		

PRACTICALS/LAB WORK			
GROSS ANATOMY			
CODE	SPECIFIC LEARNING OUTCOMES	TOPIC	
CF2-A- 009	Demonstrate and systematically identify major arteries, veins, and nerves on anatomical models or cadaveric dissections; locate their course, branches, and anatomical relations; and correlate their clinical significance with surrounding structures	Surface Anatomy	
CF2-A- 010	Identify and demonstrate the origin, insertion, nerve supply, and actions of the muscles of facial expression on models or cadaveric specimens	Jaw Muscles	
CF2-A- 011	Demonstrate surface marking of extracranial branches of the facial nerve and trigeminal nerve in relation to relevant structures, and identify their anatomical pathways and clinical relevance.	Neurovascular Supply of face	
THEORY			
ANATOMY			
CODE	SPECIFIC LEARNING OUTCOMES	TOPIC	Snells Clinical Neuroanatomy 2026-2027
NS-A-001	Enlist various parts of nervous system, identify location of each part of nervous system. Recognize functions of each part of nervous system	Nervous System Overview	Pg 1-16
NS-A-002	Define neuron and discuss its structure	Neuron	Pg 33-62
NS-A-003	Classify neurons morphologically and functionally with examples	Neuron Classification	
NS-A-004	Discuss components of central and peripheral nervous system	CNS & PNS Overview	Pg 1-16
NS-A-005	Give the supporting cells in central and peripheral nervous system	Neuroglia	Pg 54-60
NS-A-006	Define & classify receptors and effectors	Receptors and Effectors	Pg 84-93
NS-A-007	Highlight major subdivisions of ANS into sympathetic and parasympathetic nervous system with comparison of anatomical differences.	Sympathetic vs. Parasympathetic System	Pg 83
NS-A-008	Enlist all cranial nerves and their distribution.	Cranial Nerves	Pg 323
NS-A-009	Give the classification, structure, and functions of peripheral nerve	Spinal Nerve	Pg 12

	fibers in a typical spinal nerve.	Anatomy	
NS-A-010	Define dermatome	Dermatome	Pg 98
NS-A-011	Enlist the parts of the brain. Enumerate their major functions.	Brain Regions & its functions	Pg 131,185
NS-A-012	Identify the location, extent, coverings, and blood supply of spinal cord	Spinal Cord Overview	Pg 471-472
NS-A-013	Tabulate nuclear organization at different levels of spinal cord	Spinal Cord Nuclei	Pg 131-162
NS-A-014	Draw & label the transverse section of spinal cord at mid cervical level showing ascending & descending tracts	Spinal Cord Cross-Section	Pg 136
NS-A-015	Define gray & white matter and differentiate amongst Fasciculus tract & Lemniscus tract	Spinal Cord Gray & White Matter	Pg 142-162
NS-A-016	Give the external feature of brain stem	Mid brain, Pons, Medulla & its blood supply	Pg 191

NS-A-017	Draw & Label cross-sections of the brainstem at the levels of the midbrain, pons, and medulla	Brainstem Cross Sectional Anatomy	Pg 195
NS-A-018	Discuss the location of cranial nerve nuclei their functional components, and distribution, and its exit from respective skull foramina.	Cranial Nerve Nuclei and Pathways	Pg 323-353
323	Identify the lobes of cerebellum	Cerebellar Lobes	Pg 229-231
NS-A-020	Define important clinical correlates, vermis syndrome, ataxia, dysarthria, dysdiadochokinesia, nystagmus, and vertigo.	Cerebellar Clinical Correlates	Pg 241
NS-A-021	Discuss internal structure of cerebral hemisphere (white matter, basal ganglia, lateral ventricle)	Cerebral Hemisphere Structure	Pg 249
NS-A-022	Briefly explain ventricular system (Lateral, 3rd & 4th ventricles)	Ventricular System	Pg 436-452
NS-A-023	Briefly explain various parts of internal capsule	Internal Capsule	Pg 146-149
NS-A-024	Draw and label the formation of Circle of Willis	Circle of Willis	Pg 470
NS-A-025	Explain meninges of the brain	Meninges	Pg 418
NS-A-026	Give the location, origin and termination of dural venous sinuses.	Dural Venous Sinuses	Pg 469
NS-A-027	Discuss the important structures associated with the cavernous sinus and its clinical significance in relation to the danger area of the face	Cavernous Sinus	Pg 470
NS-A-028	Discuss the anatomical basis of extradural, subdural and subarachnoid hemorrhages	Intracranial Hemorrhages	Pg 472
NS-A-029	Explain the formation, circulation and absorption (Cerebrospinal fluid)	CSF Physiology	Pg 448
NS-A-030	Discuss the origin, course, branches and distribution of internal carotid and vertebral artery	Brain Blood Supply	Pg 464-469
NS-A-031	Enlist the nuclei of thalamus and hypothalamus along with its functions & connection	Thalamus & Hypothalamus Connections	Pg 363-383

PRACTICALS / LAB WORK		
NEUROANATOMY		
CODE	SPECIFIC LEARNING OUTCOMES	TOPIC
NS-A-036	Demonstrate gross neuroanatomical knowledge of the brain and brainstem with particular focus on the cranial nerves, including identification of their origin, course, nuclei, associated foramina, functional components, and clinical correlations using anatomical models and dissected cadaveric specimens	Nervous system

BIOCHEMISTRY

CODE	SPECIFIC LEARNING OUTCOMES	RESOURCES
F2-B-001	Describe the structure of heme and briefly describe the steps of heme synthesis with its regulation.	Lippincott Illustrated Reviews Biochemistry (8 th edition). Chapter No: 21 Amino acids: Conversion to specialized products Page. No: 308 to 310
	Explain the metabolism of iron, including its absorption, transport (transferrin), storage (ferritin, hemosiderin), and regulation.	Lippincott Illustrated Reviews Biochemistry (8 th edition). Chapter No: 29 Micronutrients: Minerals Page. No: 450-451
	How does heme combine with globin to form hemoglobin and enlist the functions of hemoglobin.	Lippincott Illustrated Reviews Biochemistry (8 th edition).
	Enlist the types of hemoglobin along with their percentage and chain composition.	Chapter No: 3
	Understand the oxygen-binding mechanism of hemoglobin, including the concepts of cooperative binding and allosteric regulation.	Globular proteins Page. No: 26-41.

	Describe hemoglobin structure, functions, and oxygen dissociation curve. Include hemoglobinopathies (sickle cell anemia, thalassemia).	
	Explain the significance of HbA1c.	
	Describe the structure and functions of myoglobin; compare and contrast with hemoglobin in terms of oxygen-binding and clinical relevance (MI marker).	
F2-B-002	Define and explain the biochemical basis of porphyria along with its classification.	Lippincott Illustrated Reviews Biochemistry (8 th edition).
	Describe the oral and dental manifestations of porphyria, including erythrodontia, photosensitivity, mucosal lesions, and delayed healing.	Chapter No: 21 Amino acids: Conversion to specialized products Page. No: 311 to 313 • Handouts
F2-B-003	Describe RBC metabolism (glycolysis, pentose phosphate pathway, G6PD deficiency) and role of trace elements (iron, selenium).	• Lippincott Illustrated Reviews Biochemistry (8 th edition). Chapter No: 8
	Explain RBC metabolism, including glycolysis, pentose phosphate pathway, and G6PD deficiency.	Introduction to metabolism & glycolysis Page. No: 105 to 115.
	Describe and outline the steps in hexose monophosphate pathway (HMP) and its significance in RBCs.	• Lippincott Illustrated Reviews Biochemistry (8 th edition).
	Compare and contrast glycolysis and the HMP shunt.	Chapter No: 29 Micronutrients: minerals
	Explain hemolytic anemia due to pyruvate kinase and glucose-6-phosphate dehydrogenase deficiencies.	Page. No: 454. • Lippincott Illustrated Reviews Biochemistry (8 th edition). Chapter No: 13 Pentose phosphate pathway & nicotinamide adenine dinucleotide phosphate Page. No: 160 to 169.

		Handouts
F2-B-004	Describe vitamins (A, B6, B9, B12, E), their active forms, sources, RDA, biochemical roles, and deficiency manifestations.	Lippincott Illustrated Reviews Biochemistry (8th edition). Chapter No: 28 Micronutrients: Vitamins Page. No: 424 to 429, 432-436, 441. Handouts

MODULE 5 (CRANIOFACIAL-II) 3 WEEKS

CODE	SPECIFIC LEARNING OUTCOMES	RESOURCES
CF2-B-001	Describe the structure, types, biosynthesis, and functions of collagen and elastin, and explain their roles in maintaining the mechanical strength and elasticity of muscle connective tissue.	Lippincott Illustrated Reviews Biochemistry (8th edition). Chapter No: 4
	Identify disorders associated with collagen and elastin defects, particularly those affecting muscle support structures and connective tissue integrity.	Fibrous proteins Page. No: 45-53.
	Explain the composition and function of the extracellular matrix (ECM) in muscle tissue, including the roles of proteoglycans, collagen, fibronectin, and integrins in muscle cell adhesion, signaling, and repair.	- Lippincott Illustrated Reviews Cell & Molecular biology. Chapter No: 2 Extracellular Matrix & cell adhesion Page. No: 9-23. - Handouts
CF2-B-002	Explain the structure and basic function of the electron transport chain (ETC) and describe how oxidative phosphorylation generates ATP in muscle cells.	Lippincott Illustrated Reviews Biochemistry 8th edition Chapter No: 6 Bioenergetics & oxidative phosphorylation Page. No: 80-87
	Explain the processes of glycogenesis and glycogenolysis in muscle tissue, including their regulation, the role of key enzymes,	Lippincott Illustrated Reviews Biochemistry 8th edition

	and their contribution to ATP production during exercise.	Chapter No: 11 Glycogen Metabolism Page. No: 137-146.
	Discuss the role of muscle glycogen as an energy source during different exercise intensities, its depletion and recovery, and how regular exercise influences glycogen storage capacity and muscle adaptation.	- Lippincott Illustrated Reviews Biochemistry 8th edition Chapter No: 11 Glycogen Metabolism Page. No: 137-146. - Harper's Illustrated Biochemistry (31st edition) Chapter No: 18 Metabolism of glycogen Page No. 164
	Describe the ATP–phosphocreatine (ATP-PC) system and its role in providing immediate energy during short-term, high-intensity muscle activity.	- Harper's Illustrated Biochemistry (31st edition) Chapter No: 51 Muscle & the cytoskeleton Page No. 620-621. - Handouts
	Differentiate muscle fiber types (Type I, IIa, IIb) based on structure, metabolism, and functional properties.	- Marks' basic medical Biochemistry A clinical approach (4th edition) Chapter 47 Metabolism of muscle at rest & during exercise. Page No. 885-886. - Handouts
CF2-B-003	Describe vitamin C and its active forms, sources, RDA, biochemical roles, and deficiency manifestations.	Lippincott Illustrated Reviews Biochemistry 8th edition Chapter No: 28 Micronutrients: Vitamins

		Page. No: 427-428. - Harper's Illustrated Biochemistry (31st edition) Chapter No: 44 Micronutrients: Vitamins & minerals Page No. 539-540. - Handouts
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MODULE 6 (NEUROSCIENCES-I) 4 WEEKS

CODE	SPECIFIC LEARNING OUTCOMES	RESOURCES
NS-B-001	Elaborate the structure of mannitol & give its clinical uses.	Handouts
NS-B-002	Discuss neuropathies associated with deficiency/ toxicity of B1, B6 & B12.	- Lippincott Illustrated Reviews Biochemistry 8th edition Chapter No: 28 Micronutrients: Vitamins Page. No: 425-429. - Handouts
NS-B-003	Explain the biosynthesis, mechanism of action, and physiological role of acetylcholine, and discuss the clinical consequences of its deficiency.	Handouts
	Outline the reactions involved in biosynthesis of catecholamines.	Lippincott Illustrated Reviews Biochemistry 8 th edition Chapter No: 21 Amino acids: Conversion to specialized products. Page. No: 317-319.
	Elaborate the mechanism of action of catecholamines.	Lippincott Illustrated Reviews Biochemistry 8 th edition Chapter No: 8

		Introduction to metabolism & glycolysis Page. No: 103-105.
NS-B-004	Briefly describe the cause, clinical features & management of Phenylketonuria.	- Lippincott Illustrated Reviews Biochemistry 8th edition Chapter No: 20 Amino acids: Degradation & synthesis Page. No: 298-303. - Lippincott Illustrated Reviews Biochemistry 8th edition Chapter No: 20 Amino acids: Degradation & synthesis Page. No: 294-295.
	Outline the metabolism of branched chain amino acids (BCAA).	
	Briefly describe the cause, clinical features & management of maple syrup urine disease (MSUD).	
NS-B-005	Briefly describe the consequences of protein misfolding (Alzheimer's disease and prion diseases).	Lippincott Illustrated Reviews Biochemistry 8 th edition Chapter No: 2 Protein structure Page. No: 21-23.

PHYSIOLOGY

CODE	SPECIFIC LEARNING OUTCOMES	TOPIC	REFERENCE	PAGE NO.
CFII-P-001	Describe the physiological anatomy of a neuron, including its structure and function.	Membrane Potentials and Action Potentials (Nerve)	Guyton & Hall. Textbook of Physiology. 14 th Edition	Chap 46 Pg 579 Lecture slides
CFII-P-002	Enlist the neuroglia cells responsible for myelination in CNS & PNS.	Myelinated and Unmyelinated Nerve Fibers		Lecture slides
	Enlist the steps of myelination in peripheral nervous system.			Lecture slides
	Define Multiple sclerosis.			Lecture slides
CFII-P-003	Explain Nernst potential of Na & K.	Membrane Potentials	Guyton and Hall 14 th Ed.	Chap 5 Pg.63-66
	Derive the Nernst equation.			
	Explain the physiological basis of the Goldman equation and write the equation.			
CFII-P-004	Describe the resting membrane potential of a nerve fiber and the role of various ion channels.	Resting Membrane Potential	Guyton & Hall. Textbook of Physiology. 14 th Edition	Chap 5 Pg.66-71,76
	Discuss role of different channels in calculating resting membrane potential.			
CFII-P-005	Define Action potential and ionic basis.	Action Potentials		
	Discuss the role of voltage-gated channels in generating action potentials.			
	Define threshold stimulus.			
	Define the All-or-None Law.		Guyton & Hall. Textbook of Physiology. 14 th Edition	Chap 5 Pg. 71,72,76,
	Define absolute and relative refractory periods and their physiological basis. Discuss the effects of hypocalcemia on nerve excitability.			

	Explain the mechanism of local anesthetics on nerve excitability.			
CFII-P-006	Explain the propagation of action potentials.	Propagation of the Action Potential	Guyton & Hall. Textbook of Physiology. 14 th Edition	Chap 5 Pg 71-75
	Define Saltatory conduction and its benefits.			
	Explain mechanism of tetany.			
CFII-P-007	Describe the physiological anatomy of skeletal muscles.	Contraction of Skeletal Muscle	Guyton & Hall. Textbook of Physiology. 14 th Edition	Chap 6 Pg. 79-81
	Describe the structure of Sarcomere.			
CFII-P-008	Explain general mechanism of skeletal muscle contraction. (walk along theory)	General Mechanism of Muscle Contraction	Guyton & Hall. Textbook of Physiology. 14 th Edition	Chap 6 Pg. 81-84
CFII-P-009	Define and differentiate isotonic and isometric contractions with 2 examples of each.	Characteristics of Whole Muscle Contraction	Guyton & Hall. Textbook of Physiology. 14 th Edition	Chap 6 Pg. 87-91
	Give physiological basis of tetanization and multiple fiber summation.			
	Define motor unit and explain the mechanism of muscle contraction by illustrating the role of motor units in regulating force and precision of movement.			
	Give physiological basis of Rigor mortis. Explain muscle fatigue.			Chap 7 Pb 93-100
	Describe physiology of muscle contraction, including sliding filament theory, excitation–contraction coupling, neuromuscular junction, end-plate potential, and muscle fatigue.			
CFII-P-010	Describe the types of smooth muscle and explain their functional properties, including the latch phenomenon. .	Smooth muscles		Chap 8 Pg101-109 Lecture slides

CODE	SPECIFIC LEARNING OUTCOMES	TOPIC	REFERENCE	PAGE NO.
NS-P-001	Classify synapse and explain the physiological anatomy of chemical synapse. Elaborate the role of synapse in processing information. Classify the substances that act as neurotransmitters or synaptic transmitters. Enlist functions related to dentistry of each group. Define Excitatory and inhibitory postsynaptic potential and explain their mechanism of generation. Explain spatial and temporal summation. Explain the mechanism of synaptic fatigue (its significance) and synaptic delay. Discuss the effects of hypoxia, acidosis and alkalosis on synaptic transmission	Organization of the Nervous System, Basic Functions of Synapses, and Neurotransmitters	Guyton & Hall. Textbook of Physiology. 14 th Edition	Chap 46 Pg. 579-95
NS-P-002	Define and classify the sensory receptors in the body on the basis of stimuli they detect.	Sensory Receptors, Neuronal Circuits for Processing Information	Guyton & Hall. Textbook of Physiology. 14 th Edition	Chap 47 Pg. 597-607
NS-P-003	Discuss tonic and phasic receptors with two to three examples of each	Sensory Receptors, Transduction of sensory stimuli into nerve impulses	Guyton & Hall. Textbook of Physiology. 14 th Edition	Chap 47 Pg.
NS-P-004	Classify the nerve fibers on the basis of diameter and speed of conduction	Receptors Transduction of sensory stimuli into nerve impulses	Guyton & Hall. Textbook of Physiology. 14 th Edition	Chap 48 Pg. 609-619
NS-P-005	Classify somatic sensations. Explain two main ascending pathways (DCML and Anterolateral system) for	Somatosensory cortex	Guyton & Hall. Textbook of Physiology. 14 th Edition	Chap 49 Pg. 623-632

	transmitting sensation to CNS. Enlist sensations carried by dorsal column medial Lemniscal system and Anterolateral Pathway with special reference to Trigeminal sensory system. Trace these pathways from receptors to sensory cortex and compare their features. Give location and functions of Primary somesthetic area and sensory association area of sensory cortex. Name the sensations perceived by these areas. Describe the sensations lost when there is damage to somesthetic areas. Discuss representation of body parts in sensory cortex			
NS-P-006	Tabulate the sensory nerve endings, and anatomical sites of first, second, third order neurons of ascending tracts.	Ascending Tracts	Guyton & Hall. Textbook of Physiology. 14 th Edition	Chap.56 Pg.706-716
NS-P-007	Trace the descending tracts.	Descending Tracts	Guyton & Hall. Textbook of Physiology. 14 th Edition	Chap.5 Pg.711-716
NS-P-008	Differentiate clearly between upper and lower motor neuron lesions	UMN vs. LMN Lesions		Lecture slides
NS-P-009	Identify the lobes, sulci & gyri	Cerebral Cortex Anatomy	Guyton & Hall. Textbook of Physiology. 14 th Edition	Lecture slides
NS-P-010	Describe functional areas of cerebrum	Functional Cortex	Guyton & Hall. Textbook of Physiology. 14 th Edition	Chap.58 Pg.739-747
NS-P-011	Define and give physiological basis of referred pain with two examples.	Referred Pain & Trigeminal Neuralgia	Guyton & Hall. Textbook of Physiology. 14 th Edition	Chap.49 Pg.628-629
NS-P-012	Name the motor areas of cerebral cortex and give representation of body parts. Discuss the functions of motor areas Enlist the functions of brain stem	Cortical and Brain Stem Control of Motor Function	Guyton & Hall. Textbook of Physiology. 14 th Edition	Chap.56 Pg.709-721

	Name the descending motor tracts. Describe the functions of corticospinal tract.			
NS-P-013	Give Functional organization of spinal cord. Define reflex action and identify the components of a reflex arc. Define, classify and enlist components of stretch reflex with special reference to jaw reflex).	Spinal Cord Motor Functions and reflexes	Guyton & Hall. Textbook of Physiology. 14 th Edition	Chap.55 Pg.697-704
NS-P-014	Define and give types of cerebrovascular accident along with their salient features.	Effect of Lesions in the Motor Cortex or in the Corticospinal Pathway	Guyton & Hall. Textbook of Physiology. 14 th Edition	Chap.61 Pg.794
NS-P-015	Enlist the components of limbic system and its general functions. Enlist functions of different portions hypothalamus. Explain the physiological basis and features of Alzheimer 's disease	The Limbic System and the Hypothalamus	Guyton & Hall. Textbook of Physiology. 14 th Edition	Chap.59 Pg.753-761
NS-P-016	Define memory. Memory Classify memory on the basis of duration and information stored.	Memory	Guyton & Hall. Textbook of Physiology. 14 th Edition	Chap.52 Pg.747-751
NS-P-017	Define retrograde and anterograde amnesia Explain the effects of sympathetic and parasympathetic on various organs/ system of body Enlist types of autonomic receptors present in heart, blood vessels, smooth muscles, GIT, & EYE. Give features of Alarm or stress response	The Autonomic Nervous System and the Adrenal Medulla	Guyton & Hall. Textbook of Physiology. 14 th Edition	Chap.61 Pg.783-788
NS-P-	Enlist the functions of CSF	Cerebral	Guyton & Hall. Textbook of	Chap.62

018		circulation	Physiology. 14 th Edition	Lecture slides
NS-P-019	Give functional divisions of cerebellum along with their functions. Enlist cerebellar nuclei Enlist features of cerebellar dysfunction	Cerebellum and Basal Ganglia Contributions to Overall Motor Control	Guyton & Hall. Textbook of Physiology. 14 th Edition	Chap.57 Pg.723-732
NS-P-020	Enlist components of basal ganglia in relation to other structures of the Brain Discuss functions of basal ganglia Discuss pathophysiology and features of Parkinson's disease.	Contributions to Overall Motor Control		Chap 57 Pg 732-737
NS-P-021	Enlist the primary taste sensations. The Chemical Senses— Taste and Smell Trace the taste pathway Enlist the primary sensations of smell Describe the physiological anatomy and location of olfactory membrane and olfactory receptors	The Chemical Senses— Taste and Smell		Chap54 Pg 687-694

CODE	SPECIFIC LEARNING OUTCOMES	TOPIC	Reference
NS-P-022	Examination of Trigeminal nerve	CN V	Physiology Practical Copy

NS-P-023	Examination of Facial nerve	CN VII	
NS-P-024	Examination of 9th, 10th, 11th & 12th nerve.	CN IX, X, XI, XII	
NS-P-025	Demonstrate Plantar reflex.	Motor System	
NS-P-026	Demonstrate deep tendon reflex.	Motor System	

ORAL BIOLOGY

Code	Learning objectives	Topic	Book and Page no.
F2-OB-001	Describe the composition and functions of dentin and pulp; correlate structural features with clinical conditions.	Pulp–Dentin Complex	Ten Cate 9 th Edition Chapter 8, pg. no. 157-191
F2-OB-002	Explain the structure, functions, and degradation of the extracellular matrix in oral tissues	Extracellular Matrix	Ten Cate 9 th Edition Chapter 4, pg. no. 58-59
F2-OB-003	Describe the process of Dentinogenesis. Differentiate between the three main types of dentins: primary, secondary, and tertiary; and describe their locations and formation. Describe the mechanisms that control dentin mineralization, and differentiate between the pattern of mineralization in mantle dentin and circumpulpal dentin. Explain the processes of secondary and tertiary Dentinogenesis, including the stimuli that trigger their formation. Describe the structure and function of dentinal tubules. Differentiate between peritubular and intertubular dentin, and explain the respective compositions and roles. Explain the formation and significance of sclerotic dentin and interglobular dentin. Describe the structural features of dentin,	Dentin	Ten Cate 9 th Edition Chapter 8, pg. no. 157-191

	including incremental growth lines and granular layer of Tome's.		
F2-OB-004	Describe the cellular contents and zones of the dental pulp. Discuss the innervation, vascular supply, and lymphatic supply of the dentin–pulp complex. Explain the mechanisms of dentin sensitivity, focusing on the hydrodynamic theory. Describe the formation and clinical significance of pulp stones (denticles). Explain the age-related changes that occur in the dentin–pulp complex. Analyze the pulp's cellular response to dental caries and the mechanical trauma of cavity preparation.	Pulp	Ten Cate 9 th Edition Chapter 8, pg. no. 157-191
F2-OB-005	Develop a detailed timeline chart illustrating the calcification stages and eruption periods for deciduous and permanent dentition.	Developmental Timeline and Chronology of Dentition	Concise Dental Anatomy and Morphology, by Fuller, 5Th Edition, Unit 1
F2-OB-006	Describe the anatomy of the pulp tissue and pulp cavities in teeth.	Pulp Anatomy	Concise Dental Anatomy and Morphology, by Fuller, 5Th Edition, Unit 9
F2-OB-007	Explain the age-related morphological and physiological changes occurring in the pulp cavity.	Age-Related Changes in the Pulp	Ten Cate 9 th Edition Chapter 8, pg. no. 157-191

Practical			
F2-OB-008	Draw and label dentin types (primary, secondary, tertiary), tubules, pulp zones, odontoblasts, interglobular dentin, dead tracts, pulp stones. Identify the dentin and pulp radiographically Identify the Dento-enamel junction radiographically	Dentin & Pulp	Ten Cate 9 th Edition Chapter 8, fig. 8.1, 8.7, 8.20, 8.22, 8.27, 8.28, 8.34, 8.63, 8.67

Craniofacial-II module 5 (3 weeks)

Code	Learning objectives	Topic	Book and Page no.
CF2-OB-001	Describe the chemical composition of bone. Describe the functions of osteoblasts, osteocytes, and osteoclasts in Bone Formation and Remodeling Describe the process of intramembranous and endochondral ossification Describe the microscopic Structure of Bone: (Osteon, central canal, lamellae, lacunae, canaliculi, and blood vessels) Explain of regulation of bone cell formation	Bone	Ten Cate 9 th Edition Chapter 6, pg. no. 91-111
Practical's			
CF1-OB-002	Draw and label osteoblasts, osteocytes, and osteoclasts and correlate each with its	Bone	Ten Cate 9 th Edition Chapter

	function.		6, fig. 6.7. 6.22
CF1-OB-003	Draw and label the stages / histological features of intramembranous and endochondral ossification.	Ossification	Ten Cate 9 th Edition Chapter 6, fig. 6.24, 6.28

Alveolocemental Complex-I Module 7 (2 weeks)

Code	Learning objectives	Topic	Book and Page no.
ALC-OB-001	Define the alveolo-cemental complex (periodontium) and explain its role in dental support.	Periodontium Overview	Ten Cate 9 th Edition Chapter 9, pg. no. 193-107
ALC-OB-002	Identify its components (cementum, PDL, alveolar bone, gingiva) and their diagrammatic arrangement around the tooth.	Components Of Periodontium	Ten Cate 9 th Edition Chapter 1, pg. no. 2
ALC-OB-003	Define cementum and explain its biochemical properties Classify, explain and differentiate between different types of cementum and its properties	Cementum	Ten Cate 9 th Edition Chapter 9, pg. no. 194-204
ALC-OB-004	Describe the process of Cementogenesis. Explain molecular factors associated with Cementogenesis	Cementogenesis	Ten Cate 9 th Edition Chapter 9, pg. no. 194-204
ALC-OB-005	Classify and explain the structure of different types of	Types of Cementum	Ten Cate 9 th Edition Chapter 9, pg. no. 194-

	cementum and their properties.		204
ALC-OB-006	Explain age-related changes of cementum.	Age-related changes of cementum	Ten Cate 9 th Edition Chapter 9, pg. no. 194-204
ALC-OB-007	Describe cements enamel junction (CEJ) and attachment of cementum onto dentin	CEJ	Ten Cate 9 th Edition Chapter 9, pg. no. 194-204
ALC-OB-008	Differentiate between the structure of cellular and acellular cementum.	Cellular vs Acellular Cementum	Ten Cate 9 th Edition Chapter 9, pg. no. 194-204
ALC-OB-009	Describe the structure and functions of alveolar bone.	Alveolar Bone Structure and Function	Ten Cate 9 th Edition Chapter 9, pg. no. 205
ALC-OB-010	Elaborate its changes with age and its clinical considerations.	Alveolar Bone Structure and Function	Ten Cate 9 th Edition Chapter 9, pg. no. 205
ALC-OB-011	Outline the chronological stages of healing in an Extraction Socket, from the formation of the blood clot to the final replacement by lamellar bone.	Bone Repair and Remodeling in the Extraction Socket	Ten Cate 9 th Edition Chapter 15
ALC-OB-012	Discuss the development of the Periodontal Ligament (PDL)	Development of PDL	Ten Cate 9 th Edition Chapter 9, pg. no. 205-218

ALC-OB-013	Enlist the structure and function of the periodontal ligament.	PDL Structure & Function	Ten Cate 9 th Edition Chapter 9, pg. no.205- 218
ALC-OB-014	Describe the cellular component of PDL	PDL cellular component	Ten Cate 9 th Edition Chapter 9, pg. no.205- 218
ALC-OB-015	Describe the principal fiber bundles of PDL.	PDL Fiber Bundles	Ten Cate 9 th Edition Chapter 9, pg. no.205- 218
ALC-OB-016	Describe the adaptation of the periodontal ligament to the functional demands.	Functional Adaptation of Periodontal Ligament	Ten Cate 9 th Edition Chapter 9, pg. no.205- 218
ALC-OB-017	Describe the blood supply and nerve supply of PDL	Blood and Nerve Supply of PDL	Ten Cate 9 th Edition Chapter 9, pg. no.205- 218
ALC-OB-018	Describe the mechanisms of PDL cell recruitment during tissue turnover and repair.	PDL remodeling and regeneration.	Ten Cate 9 th Edition Chapter 9, pg. no.205- 218
ALC-OB-019	Describe the histological aspects of gingiva.	Gingival Histology	Ten Cate 9 th Edition Chapter 12, pg. no. 278- 286
ALC-OB-020	Enumerate gingival fibers & their functions.	Gingival Fibers	Ten Cate 9 th Edition Chapter 9, 211
ALC-OB-021	Tabulate blood and nerve supply of gingiva.	Gingival Blood and Nerve Supply	Ten Cate 9 th Edition Chapter 12, pg. no. 286
ALC-OB-022	Describe the structural and functional characteristics of different areas of Gingival epithelium	Gingival Epithelium	Ten Cate 9 th Edition Chapter 12, pg. no. 278- 286
ALC-OB-023	Describe gingival sulcus and explain the development and structure of dentogingival junction (DEJ)	Dentogingival Junction	Ten Cate 9 th Edition Chapter 12, pg. no. 278- 286

ALC-OB-024	Explain the histological mechanisms of repair at the DEJ	Healing and Regeneration of the DEJ	Ten Cate 9 th Edition Chapter 15
ALC-OB-025	Explain the structure of mucogingival junction.	Mucogingival junction.	Ten Cate 9 th Edition Chapter 12, pg. no. 283
ALC-OB-026	Describe eruption and phases of tooth movement.	Tooth Eruption Phases Pre-eruptive Tooth Movement	Ten Cate 9 th Edition Chapter 10, pg. 218-220
	Elaborate pre-eruptive tooth movement.		
ALC-OB-027	Discuss the mechanism and factors responsible for eruptive tooth movement.	Eruptive Tooth Movement Mechanisms	Ten Cate 9 th Edition Chapter 10, pg. 218-220
ALC-OB-028	Describe the types of movement a tooth makes post- eruption to maintain its functional position in the jaw in terms of mechanism and significance.	Post-eruptive Tooth Movements	Ten Cate 9 th Edition Chapter 10, pg. 220-222
ALC-OB-029	Discuss histology and causes of tooth shedding.	Tooth Shedding	Ten Cate 9 th Edition Chapter 10, pg. 222-226
	Practicals		
ALC-OB-030	Draw and label the differentiation of cementoblasts from ectomesenchymal cells & the fragmentation of Hertwig's epithelial rootsheath.	Cementoblast	Ten Cate 9 th Edition Chapter 9, fig. 9.1
ALC-OB-031	Draw and label the types of cements enamel junction	CEJ	Ten Cate 9 th Edition Chapter 9, fig. 9.15
ALC-OB-032	Draw and label cellular cementum.	Cellular Cementum	Ten Cate 9 th Edition Chapter 9, fig. 9.9
ALC-OB-033	Draw and label the alveolar and bundle bone	Alveolar & Bundle Bone	Ten Cate 9 th Edition Chapter 9, fig. 9.16, 9-18
ALC-OB-034	Draw and label the periodontal ligament in a cross-section between teeth	PDL cross- section	Ten Cate 9 th Edition Chapter 9, fig. 9.25
ALC-OB-035	Draw and label the arrangement of principal fiber group within the periodontium.	Principal fibers group of PDL	Ten Cate 9 th Edition Chapter 9, fig. 9.25
ALC-OB-036	Draw and label the gingival group of fibers	Gingival group of	Ten Cate 9 th Edition Chapter

	(gingival ligament).	fibers	9, fig. 9.25
ALC-OB-037	Draw and label different anatomical zones of gingiva; mucocutaneous junction, mucogingival junction, & dentogingival junction.	Gingiva & its Junctions	Ten Cate 9 th Edition Chapter 12, fig. 12.32, 12.33

GENERAL PATHOLOGY AND MICROBIOLOGY

Sr.#	Topic	Reading Material
F2-Pa-001	Describe intracellular accumulations (lipids, proteins, glycogen, pigments). Define calcification; differentiate between dystrophic and metastatic calcification.	Robbin's BASIC PATHOLOGY 10TH edition
F2-Pa-002	Define pigmentation; describe endogenous (melanin, hemosiderin) and exogenous pigments (carbon, tattoos). Define amyloidosis; describe pathogenesis and morphology.	Robbin's BASIC PATHOLOGY 10TH edition
F2-Pa-003	Define and explain cellular adaptations: atrophy, hypertrophy, hyperplasia, metaplasia, dysplasia	Robbin's BASIC PATHOLOGY 10TH edition
F2-Pa -004	Define aging; describe theories of aging and morphological features.	Robbin's BASIC PATHOLOGY 10TH edition
F2-Pa-005	Define acute and chronic inflammation and enlist cardinal signs. Enumerate the differences between acute and chronic inflammation	Robbin's BASIC PATHOLOGY 10TH edition
F2-Pa-006	Define wound healing (primary vs secondary intention).	Robbin's BASIC PATHOLOGY 10TH edition

MICROBIOLOGY

Sr.#	Topic	Reading Material
F2-Pa-007	Define microbes and describe their role in health and disease Differentiate between prokaryotic and eukaryotic microorganisms. Classify bacteria according to morphology and staining characteristics. Describe bacterial structure, spores, and growth curve. Describe the composition and types of culture media (selective, differential, enrichment). Compare and contrast applications of different culture media used in microbiology and oral diagnostic labs.	Levinson's review of Medical Microbiology and Immunology 18th edition
F2-Pa-008	Define aerobic and anaerobic growth and explain fermentation in oral bacteria. Discuss the role of iron metabolism in bacterial growth and virulence. Define mutation and its types; explain recombination. Discuss DNA transfer within and between bacterial cells (conjugation, transformation, transduction). Explain the mechanisms of bacterial resistance to antibiotics.	Levinson's review of Medical Microbiology and Immunology 18th edition
F2-Pa-009	Define sterilization, disinfection, cross infection and antisepsis. Describe common methods of sterilization and disinfection (physical and chemical). Explain the application of these methods in dental clinical practice to prevent cross-infection.	Levinson's review of Medical Microbiology and Immunology 18th edition
F2-Pa -010	Define normal flora, colonizer, and dysbiosis. Discuss the normal flora of different body sites, especially the oral cavity and skin. Describe their distribution, beneficial roles, and contribution to	Levinson's review of Medical Microbiology and Immunology 18th edition

	opportunistic infections.	
F2-Pa-011	Define pathogen, pathogenesis, virulence factors, ID₅₀, and LD₅₀. Identify factors influencing microbial pathogenicity, including host and immune evasion mechanisms. Discuss principles and stages of bacterial pathogenesis. Explain determinants of pathogenesis: transmission, adherence, invasion, inflammation, toxin production, immune pathogenesis. Discuss the role of biofilm and glycocalyx in infections, particularly dental plaque and chronic oral infections. Enlist different bacterial strains that cause distinct diseases. Define typical stages of an infectious disease.	Levinson's review of Medical Microbiology and Immunology 18th edition
F2-Pa-012	Summarize the mechanism of action of major antimicrobial classes (e.g., β-lactams, aminoglycosides). Identify appropriate antibiotic agents for bacterial infections of dental relevance. Explain mechanisms of bacterial resistance and their implications in dental practice.	Levinson's review of Medical Microbiology and Immunology 18th edition
F2-Pa-013	Define osteomyelitis and list microorganisms commonly associated with it. Discuss Actinomycetes with emphasis on epidemiology, virulence factors, and pathogenesis in cervicofacial infections.	Levinson's review of Medical Microbiology and Immunology 18th edition
F2-Pa-014	Describe the structure and classification of viruses (DNA and RNA). Explain basic principles of viral replication and its clinical relevance in oral infections.	Levinson's review of Medical Microbiology and Immunology 18th edition
F2-Pa-015	Describe the structure and classify fungi.	Levinson's review of Medical Microbiology and Immunology 18th edition

PRACTICAL

Sr.#	Topic	Reading Material
F2-Pa-016	Identify cellular adaptations (metaplasia) in pictures	Robbin's BASIC PATHOLOGY 10TH edition
F2-Pa-017	Perform Gram staining on bacterial smears and identify Gram-positive and Gram-negative bacteria & ZN for MTB under the microscope.	Levinson's review of Medical Microbiology and Immunology 18th edition
F2-Pa-018	Demonstrate appropriate disinfection methods for dental instruments and materials	Levinson's review of Medical Microbiology and Immunology 18th edition
F2-Pa-019	Demonstrate appropriate sterilization methods (autoclave, dry heat, & moist heat) for dental instruments.	Levinson's review of Medical Microbiology and Immunology 18th edition
F2-Pa-020	Identify culture media used in Microbiology laboratory for identification of pathogens (blood agar, chocolate agar, Mc Conkey agar, Nutrient agar, SDA, LJ medium, TSI, Citrate, Urease).	Levinson's review of Medical Microbiology and Immunology 18th edition

MODULE 5: CRANIOFACIAL 2

PATHOLOGY AND MICROBIOLOGY

Sr.#	Topic	Reading Material
CF2-Pa-001	Define microbial teratogens, Define TORCH infections and identify the impact of maternal infections (TORCH complex) on embryonic development and their dental implications.	Levinson's review of Medical Microbiology and Immunology 18th edition
CF2-Pa-002	Describe the epidemiology, transmission, virulence factors, pathogenesis, laboratory diagnosis, and prevention of Staphylococci	Levinson's review of Medical Microbiology and Immunology 18th edition
CF2-Pa-003	Describe the epidemiology, transmission, virulence factors, pathogenesis, laboratory diagnosis, and prevention of Mucormycosis	Levinson's review of Medical Microbiology and Immunology 18th edition

CF2-Pa-004	Describe the epidemiology, transmission, virulence factors, pathogenesis, laboratory diagnosis, and prevention of Streptococci	Levinson's review of Medical Microbiology and Immunology 18th edition
CF2-Pa-005	Describe the epidemiology, transmission, virulence factors, pathogenesis, laboratory diagnosis, and prevention of Actinomyces	Levinson's review of Medical Microbiology and Immunology 18th edition
CF2-Pa-006	Describe the epidemiology, transmission, virulence factors, pathogenesis, laboratory diagnosis, and prevention of Corynebacterium diphtheriae	Levinson's review of Medical Microbiology and Immunology 18th edition
CF2-Pa-007	Describe the epidemiology, transmission, virulence factors, pathogenesis, laboratory diagnosis, and prevention of Porphyromonas	Levinson's review of Medical Microbiology and Immunology 18th edition
CF2-Pa-008	Describe the epidemiology, transmission, virulence factors, pathogenesis, laboratory diagnosis, and prevention of Fusobacterium	Levinson's review of Medical Microbiology and Immunology 18th edition
CF2-Pa-009	Describe the epidemiology, transmission, virulence factors, pathogenesis, laboratory diagnosis, and prevention of Candida	Levinson's review of Medical Microbiology and Immunology 18th edition

MODULE 6: NEUROSCIENCES 1**GENERAL PATHOLOGY MICROBIOLOGY**

Sr.#	Topic	Reading Material
NS-Pa-001	Define meningitis. Identify different types of meningitis according to etiology. Differentiate between the CSF findings of different types of meningitis Define encephalitis. Describe its etiology and pathogenesis Describe the epidemiology, transmission, virulence factors, pathogenesis, laboratory diagnosis, and prevention of Streptococcus pneumoniae Describe the epidemiology, transmission, virulence factors, pathogenesis, laboratory diagnosis, and prevention of Treponema pallidum Describe the epidemiology, transmission, virulence factors, pathogenesis, laboratory diagnosis, and prevention of herpes simplex virus Describe the epidemiology, transmission, virulence factors, pathogenesis, laboratory diagnosis, and prevention of varicella zoster virus Describe the epidemiology, transmission, virulence factors, pathogenesis, laboratory diagnosis, and prevention of Clostridium tetani and Clostridium botulinum Describe the epidemiology, transmission, virulence factors, pathogenesis, laboratory diagnosis, and prevention of Spirochetes	Robbin's BASIC PATHOLOGY 10TH edition Levinson's review of Medical Microbiology and Immunology 18th edition
NS-Pa-002	Define concussion and contusion. Enlist their clinical features	Robbin's BASIC PATHOLOGY 10TH edition
NS-Pa-003	Enumerate various demyelinating diseases of CNS. Enlist clinical features and diagnosis of Multiple Sclerosis & Guillain-Barre syndrome	Robbin's BASIC PATHOLOGY 10TH edition

MODULE 7:ALVEOLOCEMENTAL COMPLEX 1**GENERAL PATHOLOGY AND MICROBIOLOGY**

Sr.#	Topic	Reading Material
ALC-Pa-001	Define acute inflammation and its pathological basis relevant to dental conditions.	Robbin's BASIC PATHOLOGY 10TH edition
ALC-Pa-002	Enlist stimuli for acute inflammation, including microbes, trauma, and chemical irritants relevant to oral infections.	Robbin's BASIC PATHOLOGY 10TH edition
ALC-Pa-003	Classify chemical mediators of acute inflammation and their role in dental diseases such as dental abscess formation	Robbin's BASIC PATHOLOGY 10TH edition
ALC-Pa-004	Explain vascular and cellular events in acute inflammation and its relation to dental conditions like pulpitis and periodontitis	Robbin's BASIC PATHOLOGY 10TH edition
ALC-Pa-005	Describe systemic effects of acute inflammation, such as fever and leukocytosis, and their impact on dental treatment.	Robbin's BASIC PATHOLOGY 10TH edition
ALC-Pa-006	Identify and explain the role of microbes causing acute inflammation in dental infections, such as Streptococcus mutans and Porphyromonas gingivalis.	Levinson's review of Medical Microbiology and Immunology 18th edition
ALC-Pa-007	Analyze morphological patterns of acute inflammation, such as purulent or fibrinous types, in oral diseases.	Robbin's BASIC PATHOLOGY 10TH edition
ALC-Pa-008	Define chronic inflammation and its significance in persistent oral and systemic conditions.	Robbin's BASIC PATHOLOGY 10TH edition
ALC-Pa-009	Identify chronic inflammatory cells, such as macrophages and lymphocytes, and mediators like TNF-a and IL-1.	Robbin's BASIC PATHOLOGY 10TH edition
ALC-Pa-010	Discuss Porphyromonas and Fusobacterium with its pathogenesis	Levinson's review of Medical Microbiology and Immunology 18th edition

PRACTICAL

Sr.#	Topic	Reading Material
ALC-Pa-011	Identify histological slides of acute, chronic & granulomatous inflammation.	Robbin's BASIC PATHOLOGY 10TH edition

ORAL PATHOLOGY

Code	Specific Learning Objective	Topic	Study Material
F2-OP-001	Describe Developmental disturbances in dentine. Explain Dentinogenesis imperfecta, regional odontodysplasia, dentine dysplasia (clinical, radiographical, histopathological)	Dentinogenesis Imperfecta	Contemporary of Oral and Maxillo-facial Pathology . Chp 1 Page 20-27
F2-OP-002	Describe Dental Caries	Dental caries	Contemporary of Oral and Maxillo-facial Pathology . Chp 3 Page 75-77

PHARMACOLOGY

PHARMACOLOGY & THERAPEUTICS			
CODE	SPECIFIC LEARNING OUTCOMES	TOPIC	References
F2-Ph-001	Describe drug absorption and factors affecting it.	Drug Transport	Katzung & Trevor's 12 th Edition Page: 27, 28 Lippincott 10 th Edition Page :4 to 11
	Describe drug distribution, including concepts of volume of distribution and plasma protein binding.		Katzung & Trevor's 12 th Edition Page: 27, 28 Lippincott 10 th Edition Page:4 to 11
F2-Ph-002	Describe drug metabolism (biotransformation, first-pass metabolism, phase I and II reactions, enzyme induction & inhibition, clinical relevance).	Drug Metabolism	Katzung & Trevor's 12 th Edition Page: 36, 38 Lippincott 10 th Edition Page :12 to 14
F2-Ph-003	Describe drug excretion, elimination, and clearance mechanisms (renal, biliary, other routes) and factors affecting them.	Drug Excretion	Katzung & Trevor's 12 th Edition Page: 7 Lippincott 10 th Edition Page :15, 16
F2-Ph-004	Define half-life, loading dose, maintenance dose, and steady-state concentration; explain their clinical relevance.	Plasma Half-Life	Lippincott 10 th Edition Page: 11, 17, 18
F2-Ph-005	Define pharmacodynamics: dose-response relationships, graded vs quantal response. Draw dose response curves.	Pharmacodynamics	Katzung & Trevor's 12 th Edition Page: 16 to 18 Lippincott 7 th Edition Page : 27 to 30
	Define receptors & describe types of drug receptors, cell signaling and mechanisms of receptor action. Describe the Phenomenon of down regulation and up regulation of Receptors		Katzung & Trevor's 12 th Edition Page: 16, 20 to 22 Lippincott 7 th Edition Page : 23 to 27
	Explain Agonist & antagonists with its types. Differentiate between agonists, antagonists, and partial agonists with examples		Katzung & Trevor's 12 th Edition Page: 18 to 20 Lippincott 7 th Edition Page : 30 to 32
	Define therapeutic index and/or therapeutic window, and explain its clinical significance. Define Median Effective (ED50), Median Toxic (TD50) & Median Lethal		Katzung & Trevor's 12 th Edition Page: 20 Lippincott 7 th Edition Page : 33

	Dose (LD50) and its clinical relevance		
F2-Ph- 006	Illustrate various phases of drug development. Describe drug interactions. Identify factors that alters drug responses(age,genetics,disease,pregnancy)		Katzung & Trevor's 15th Edition Page: 9,512-515
	Describe adverse drug reactions and their classifications Define desensitization,tachyphylaxis,tolerance, resistance,supersensitivity,hypersensitivity,superinfection,iatrogenic effects ,idiosyncrasy and give example		Katzung & Trevor's 15th Edition Page: 26,189 Lippincott 10th Edition Page : 27

PRACTICALS / LAB WORK		
CODE	SPECIFIC LEARNING OUTCOMES	TOPIC
F2-Ph- 007	Calculate drug dose & rate of infusion and unit conversions (Posology).	Dose calculation
	Apply dose calculation principles in labs.	

CODE	SPECIFIC LEARNING OUTCOMES	TOPIC	References
NS-Ph- 001	Describe the synthesis, storage, release acetylcholine and norepinephrine of the ANS	Introduction to ANS	Katzung & Trevor's 12th Edition Page: 48 to 51 Lippincott 7th Edition Page: 73 to 77
	Classify types of autonomic receptor (adrenergic and cholinergic) along with their location, actions and post receptor mechanism		Katzung & Trevor's 12th Edition Page: 51, 52 Lippincott 7th Edition Page: 73 to 77
NS-Ph- 002	Classify and name the prototype drugs acting on the autonomic nervous system according to their site and mechanism of action.	Classification	Katzung & Trevor's 12th Edition Page: 52 to 56 Lippincott 7th Edition Page: 77, 87

COMMUNITY DENTISTRY

CODE	SPECIFIC LEARNING OUTCOMES	TOPIC	Book	Paage
ALC-CD-001	Define and explain the key periodontal indices used in epidemiological studies (Gingival Index, Plaque Index, OHI-S, CPI, CPITN).	Periodontal Indices	Fundamentals of Community & Preventive Dentistry	104
ALC-CD-002	Differentiate between various periodontal conditions based on pathophysiology and clinical signs.	Periodontal Conditions	Fundamentals of Community & Preventive Dentistry	104

ALC-CD-003	Describe the stages and progression of gingivitis and periodontitis.	Disease Progression	Fundamentals of Community & Preventive Dentistry	104
ALC-CD-004	Explain the principles and methodology for measuring gingivitis and periodontitis; interpret findings using standard indices.	Measurement Methods in Periodontal Health	Fundamentals of Community & Preventive Dentistry	104
ALC-CD-005	Perform and interpret the Community Periodontal Index of Treatment Needs (CPITN) to assess periodontal status and identify treatment needs.	CPITN and Treatment Needs Assessment	Fundamentals of Community & Preventive Dentistry	109
ALC-CD-006	Conduct dietary history for caries risk assessment and demonstrate use of indices (Gingival Index, Plaque Index, CPI, CAL) in oral health surveys.	Oral Health Assessment and Risk Evaluation	Fundamentals of Community & Preventive Dentistry	111

DENTAL RADIOLOGY

CODE	Specific Learning Outcomes	Topic	Reference Books	Page Number
F2-DR-001	Describe the basic principles of dental imaging and its role in diagnosis.	Introduction to Dental Radiology	White and Pharoah's Oral Radiology: Principles and Interpretation 8 th Edition	P: 756-780
F2-DR-001	Identify the types and indications of conventional radiographs, including peri apical, bitewing and orthopantomogram (OPG)	Introduction to Dental Radiology	Selection Criteria for Dental Radiography 3 rd Edition	P: 65-68
F2-DR-002	Interpret basic dental radiographs to recognize normal anatomy and general radiological appearances of common pathology (radiolucency, radiopacity, and resorption).	Interpretation of Conventional Radiographs	Interpreting dental radiographs 1 st Edition	P:33-34

PERIODONTOLOGY

CODE	SPECIFIC LEARNING OUTCOMES	INTEGRATING DISCIPLINE	TOPIC	REFERENCE BOOK	PAGE NUMBER
ALC-OP- 001	Define key terminologies related to periodontal diseases: Gingivitis, periodontitis, periodontal pockets, clinical attachment level and periodontal bone loss	Oral Pathology and Periodontology	Periodontal Disease Terminology	Newman and Carranza's Clinical Periodontology and Implantology, 14 th edition	Chapter 8, page 93-113
ALC-OP- 002	Identify the microbial composition of healthy gingival and periodontal tissues. Explain the role of commensal bacteria in maintaining periodontal homeostasis.		Healthy Microbial Composition and Periodontal Homeostasis		Chapter 10, page 129 - 162
ALC-OP- 003	List key bacterial species involved in periodontal disease (e.g., Porphyromonas gingivalis, Tannerella forsythia, Treponema denticola).		Pathogenic Bacterial Species in Periodontal Disease		Chapter 10, page 129 - 162
ALC-OP- 004	Explain how bacterial enzymes, toxins, and metabolic byproducts contribute to tissue destruction.		Role of Bacterial Enzymes and Toxins in Tissue Destruction	Newman and Carranza's Clinical Periodontology and Implantology, 14 th edition	Chapter 8, page 93-113
ALC-OP- 005	What is Plaque biofilm and how is it form and what is its role in periodontal diseases.		Plaque Biofilm Formation and Role in Disease		Chapter 10, page 129 - 162
ALC-OP- 006	Describe dental plaque biofilm as the major factor contributing to development of periodontal disease, and its relationship with host, genetic and local predisposing factors in exacerbating periodontal conditions.		Biofilm-Host Interaction and Risk Factors		Chapter 10, page 129 - 162
ALC-OP- 007	Demonstrate the adherent nature of plaque and the inability to visualize easily. Describe why it is important to disclose plaque; and demonstrate the need for mechanical plaque removal both by the patient and professionally.	Oral Pathology and Periodontology	Plaque Visualization, Disclosure, and Mechanical Removal	Newman and Carranza's Clinical Periodontology and Implantology, 14 th edition	Chapter 10, page 129 - 162
ALC-OP- 008	Explain the role of dental calculus in periodontal disease, differentiate between supragingival and subgingival calculus, describe the formation, mineralization, and microbial composition of calculus, and explain how calculus acts as a plaque-retentive surface contributing to periodontal disease progression.		Dental Calculus Formation, Composition, and Role in Disease		Chapter 24, page 341 -358
ALC-OP- 009	Enlist other predisposing factors (other than calculus) that predispose to plaque formation and consequent periodontal disease like gingivitis.		Other Predisposing Factors for Plaque Formation		Chapter 24, page 341 -358

ALC- OP- 010	Describe the etiology and pathogenesis of scurvy with emphasis on the biochemical role of Vitamin C in collagen synthesis and its clinical implications on periodontal tissue integrity		Scurvy and Vitamin C Role in Periodontal Health		Chapter 25, page 359-379
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ASSESSMENT POLICY/ STATUTES

Regulations:

1. Professional examination shall be open to any student who: -
 - a. has been enrolled/registered and completed one academic year preceding the concerned professional examination in a constituent/affiliated college of the University.
 - b. has his/her name submitted to the Controller of Examinations, for the purpose of examination, by the Principal of the college in which he / she is enrolled & is eligible as per all prerequisites of the examination.
 - c. has his/her marks of internal assessment in all the Blocks/Clinical Clerkships sent to the Controller of Examinations through office of the Principal of the concerned college, at the end of each Block/Clinical Clerkships, as well as at the conclusion of the academic session along with the admission form for the professional examination.
 - d. Has been certified by the principal of his/her college:
 - (i) of good character;
 - (ii) of having attended not less than cumulative 75%* of the full course of lectures delivered, practical and clinical rotations conducted in the particular academic session, while maintaining 75 % attendance in each Block/Clinical Clerkship,
 - (iii) of having appeared at the Block/Clinical Clerkship Examinations conducted by the college of enrolment with at least 50 % marks* in each Block/Clinical Clerkship examination, as well as in aggregate score of all Blocks/Clinical Clerkships examinations for the concerned year;
2. Written/Theory paper in all Professional Examinations in Modular Integrated MBBS or BDS Curricula shall consist of MCQs alone, with effect from Annual 2026 Examinations. (Ref: No. UHS/REG-25/2379, dated 17.11.2025)
3. The minimum number of marks required to pass the professional examination for each Block/Clinical Clerkship shall be fifty percent (50%) in Written and fifty percent (50%) in the 'Oral/Practical/Clinical' examinations and fifty percent (50%) in aggregate, independently and concomitantly, at one and the same time. (Clinical Exam of Long & Short cases)
4. A candidate failing in one or more Blocks/Clinical Clerkships in the annual examination shall be provisionally allowed to join the next professional class till the commencement of supplementary examinations. The candidate, however, shall have to pass the failed Block/s or Clinical Clerkship in this supplementary examination failing which he / she shall be detained in the professional year. Under no circumstances, a candidate shall be promoted to the next professional class till he/she has previously passed all the Blocks/Clinical Clerkships in the preceding professional examination.

If a student appears in the Supplementary Examination for the first time as he/she did not appear in the annual examination for any reason and failed in any Block/Clinical Clerkship in the Supplementary Examination, he/she will be detained in the same class and will not be promoted to the next class.

**Notification No.UHS/REG-25/2351 Dated 13-11-2025*

5. Only one annual and one supplementary of each Professional Examination shall be allowed in a particular academic session. However, in exceptional situations, i.e., national calamities, war or loss of solved answer books in case of accident, special examination may be arranged after having observed due process of law. This will require permission of relevant authorities, i.e., Syndicate and Board of Governors.
6. Any student who fails to clear the First or Second Professional MBBS or BDS Examination, in four consecutive attempts, each, inclusive of both availed as well as un-availed attempts, after becoming eligible for the examination, and has been expelled on that account shall not be eligible for continuation of studies and shall not be eligible for admission as a fresh candidate in either MBBS or BDS.
7. The application for admission of each candidate to the professional examination shall be submitted to the Controller of Examination, through the Principal of the College, on the prescribed format, as per notified schedule, accompanied by the prescribed fee.
8. The candidates shall pay their examination fee through the Principal of their respective colleges, who shall forward the Examination Forms along with the duly paid challan of the examination fee generated from the Online Examination Form.
9. The continuous internal assessment through the Block/Clinical Clerkship, conducted by the college of enrollment, shall carry 20% weightage in the total allocated marks for the concerned Block/Clinical Clerkship in the Professional Examination conducted by the university. The score will be equally distributed to the Written and “Oral/Practical/Clinical” Examinations.
10. The marks of internal assessment through Blocks/Clinical Clerkships examination and attendance record shall be submitted to Controller of Examinations, along with question papers and keys for the Block/Clinical Clerkship examination, within two weeks of completion of each Blocks/Clinical Clerkships examination.
Further, parent-teacher meetings shall be arranged by the colleges after every Block/Clinical Clerkship examination to share feedback on the progress of students with their parents. Minutes of parent teacher meetings, academic timetables/schedule of Blocks/Clinical Clerkships and academic year study guides shall be submitted to the Department of Medical Education UHS, as well.
11. It is emphasized that fresh internal assessment or a revision of assessment for supplementary examination shall not be permissible. However, a revised internal assessment for the detained students can be submitted. The internal assessment award in a particular year will not be decreased subsequently detrimental to the detainee candidate. A proper record of the continuous internal assessment shall be maintained by the concerned department/s in the colleges.

12. The colleges may arrange remedial classes and one re-sit for each Block/Clinical Clerkship examination after fulfillment of prescribed requirements given below. The remedial classes and re-sit examination can be conducted during summer vacation/weekends, before or during preparatory leave for the concerned professional examination, subject to the following conditions:

Block/Clinical Clerkship Attendance	Remedial Classes
<75%, ≥ 50% (50-74%)	- Principal of the college may conduct remedial classes and submit result to the Examination Department, UHS, independently. - Principal of the college may conduct remedial classes for detained students, who have short attendance in the first Block/Clinical Clerkship of a professional year after detention. The college may submit record of the remedial classes to the Examination Department, UHS, independently.
<50%	- Principal of the college may submit attendance record of such students to Department of Medical Education, UHS, seeking permission for conduct of remedial Classes. The conduct of remedial classes in such cases shall be arranged only after permission from the Competent Authority in the university. - The colleges shall also have to provide the university with the reasons submitted by the candidates for short attendance along with documentary evidence for the same duly verified by the principal. - The following shall be considered as valid reasons for short attendance of the students for consideration of permission for remedial classes: - Illness/accident/surgery of the student or sickness/death of an immediate relative/being afflicted by a natural/man-made calamity or disaster or detained students (missed the first Block/Clinical Clerkship of the year), students clearing their preceding professional examination in supplementary, or late admitted students who have been permitted for joining by UHS

Marks in Block/Clinical Clerkship Examination	Re-sit Examination
<50% Marks/ Absence from Block /Clinical Clerkship Examination	Principal of the college may submit record of such students to Department of Medical Education, UHS, seeking permission for conduct of re-sit examination.

	ii. The conduct of re-sit examination in all cases shall be arranged only after permission from the Competent Authority in the university. iii. The colleges shall also have to provide the university with the reasons submitted by the candidates for absence from the Block/Clinical Clerkship examination, along with documentary evidence for the same duly verified by the principal. iv. The following shall be considered as valid reasons for absence of a student from Block/Clinical Clerkship examination, and for consideration of permission for re-sit examination: • Illness/accident/surgery of the student or sickness/death of an immediate relative/being afflicted by a natural/man-made calamity or disaster or detained students (missed the first Block/Clinical Clerkship of the year), students clearing their preceding professional examination in supplementary, or late admitted students who have been permitted for joining by UHS
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13. The following policy shall be applicable for transition of students From Traditional Subject-Based Scheme to the Modular Integrated Curriculum Scheme:

- i. The students who fail in all subjects of the professional examination, either by taking the examination or due to non-appearance, and are detained in the respective professional year, shall follow the Modular Integrated Curriculum Scheme for their teaching and assessment.
- ii. The students who fail in one or more subjects but not all the subjects of a professional examination, either by taking the examination or due to non-appearance, and are detained in the respective professional year, shall attend classes with students following the Modular Integrated Curriculum Scheme, but they will be examined in the failed subject/s according to their parent scheme, i.e., the Traditional Subject-Based Curriculum Scheme.

A. Block 2 (Craniofacial-I + Neurosciences + Alveo- cemental complex)

The examination in Block 2 shall be as follows: -

- I. One written paper of 120 marks having two parts:
 - i. Part I shall have eighty Multiple Choice Questions (MCQs) of total 80 marks (01 mark for each MCQ) and the time allotted shall be 80 minutes. There will be no negative marking.
 - i. Part II shall have Ten (10) Structured Essay Questions (SEQs) of total 40 marks (04 marks for each SEQ) and the time allotted shall be 110 minutes.
- II. 'Oral/Practical/Clinical' examination shall have 120 marks in total.

- III. The continuous internal assessment through '**Block Examination**', conducted by the college of enrollment shall carry **60** marks, i.e., 20% of the total allocated marks (300) for the block. The score will be equally distributed to the Written and 'Oral/Practical/Clinical' Examination.

STUDY PLAN



Lahore Medical & Dental College

Canal Bank North, Tulpura, Lahore-53400

Contact No: +923464418891-98

E-mail: info@lmdc.edu.pk

No. LMDC/FD/ /26 dated

TIMETABLE 1st YEAR BDS Session 2025-2026 Block 1 w.e.f. 24-3-2026

Day	8:00 am – 9:00 am	9:00 am – 09:50 am	09:50 am – 11:00am	11:00 am- 11:30 am	11:30 am – 12:30 pm	12:30 pm – 1:15 pm	1:15 pm – 2:00 pm	2:00 pm – 3:00 pm
Monday	Physiology Lecture Lecture Theatre 8	Anatomy Lecture/Tutorial Lecture Theatre 8	Histology Practical Histology Laboratory	BREAK	Community Dentistry Lecture Theatre 8	Oral Biology Lecture Lecture Theatre 8	Oral Biology Tutorial Lecture Theatre 8	Oral Pathology Lecture Theatre 8
Tuesday	8:00 am – 9:00 am	9:00 am to 10:00 am	10:00 am – 11:00 am	11:00 am – 11:30 am	11:30 am – 12:30 pm	12:30 pm – 1:15 pm	1:15 pm – 3:00 pm	
	Physiology Lecture Lecture Theatre 8	Anatomy Lecture/Tutorial Lecture Theater 8	Anatomy Lecture/Tutorial Lecture Theatre 8	BREAK	Biochemistry Lecture Lecture Theatre 8	Pharmacology Lecture Lecture Theatre 8	PRACTICALS Oral Biology Oral Biology Lab	
Wednesday	8:00 am – 8:50 am	8:50 am to 9:40 am	9:40 am – 11:00 am	11:00 am – 11:30 am	11:30 am – 12:30 pm	12:30 pm – 1:15 pm	1:15 pm – 2:00 pm	2:00 pm – 3:00 pm
	Behavioral Sciences Lecture Theatre 8	Biochemistry Lecture Lecture Theatre 8	Oral Biology Practical Oral Biology Lab	BREAK	Community Dentistry Lecture Theatre 8	Anatomy Lecture/Tutorial Lecture Theatre 8	Anatomy Lecture/Tutorial Lecture Theatre 8	PRISME Lecture Theatre 8
Thursday	8:00 am – 8:50 am	08:50 am – 9:40 am	9:40 am – 11:00 am	11:00 am – 11:30 am	11:30 am – 12:30 pm	12:30 pm – 1:15 pm	1:15 pm – 2:00 pm	2:00 pm – 3:00 pm
	Biochemistry Lecture Lecture Theater 8	Oral Biology Lecture Lecture Theater 8	LECTURE/ PRACTICAL Operative Dentistry	BREAK	Oral Biology Tutorial Lecture Theatre 8	Biochemistry Lecture Lecture Theatre 8	Anatomy Lecture/Tutorial Lecture Theatre 8	Anatomy Lecture/Tutorial Lecture Theatre 8
Friday	8:00 am – 8:50 am	8:50 am – 9:40 am	9:40 am – 10:30am	10:30 am – 11:15 am	11:15am – 12:00 pm	12:00 pm – 1:00 pm	1:00 pm – 3:00 pm	
	Oral Biology Lecture Lecture Theater 8	Biochemistry Tutorial Lecture Theatre 8	Islamiyat/ Pak.Studies Lecture Theatre 8	Anatomy Lecture/Tutorial Lecture Theatre 8	Anatomy Lecture/Tutorial Lecture Theatre 8	Pharmacology Lecture Theatre 8	SDi.	

NO. LMDC/FD/1064-82 /2026, Dated: 17-3-26

Copy for information to the:

1. Heads of all concerned departments.
2. Dental Education Department, LMDC, Lahore
3. Director Administration, Lahore Medical and Dental College, Lahore
4. Director I.T. Operation, LMDC
5. Assistant Director, Students' Affairs, LMDC.
6. M/S Ali Tours
7. Lecture Theatre In-charge.
8. Notice Board, LMDC, Lahore.
9. Class Representatives (Boys/ Girls)


PRINCIPAL / DEAN
(PROF. Dr. AQIB SOHAIL)
DENTAL COLLEGE, LMDC

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