STUDY GUIDE OF ANATOMY

THEORY of Foundation Module			
GENERAL ANATOMY			
CODE	**SPECIFIC LEARNING OUTCOMES**	**Total hours = 10**	
		BOOK AND PAGE NO.	**TOPIC**
F-A-001	Define different branches of Anatomy	General Anatomy by Laiq Hussain Siddiqui 7th Edition Page No. 4-9	Introduction to Human Anatomy: Definitions, Terminology, and Planes
	Describe the "Anatomical Position"	General Anatomy by Laiq Hussain Siddiqui 7th Edition Page No. 11	
	Discuss the planes of body	General Anatomy by Laiq Hussain Siddiqui 7th Edition Page No. 11-13	
	Describe the terms related to position, movement and laterality	General Anatomy by Laiq Hussain Siddiqui 7th Edition Page No. 13-30	
F-A-002	Discuss the structural characteristics of compact and spongy bones	General Anatomy by Laiq Hussain Siddiqui 7th Edition Page No. 32	Osteology

	Classify bones based on region, size and shape providing examples of each, preferably from the head and neck	General Anatomy by Laiq Hussain Siddiqui 7th Edition Page No. 32-40	
	Describe the general characteristics of an adult typical long bone	General Anatomy by Laiq Hussain Siddiqui 7th Edition Page No. 40-46	
	Define ossification and briefly describe the process of intramembranous and endochondral ossification	General Anatomy by Laiq Hussain Siddiqui 7th Edition Page No. 46-49	
	Describe rule of ossification	General Anatomy by Laiq Hussain Siddiqui 7th Edition Page No. 49-51	
	Describe the blood supply of various types of bones	General Anatomy by Laiq Hussain Siddiqui 7th Edition Page No. 51-54	
	Describe the features of different views of skull (Anterior, Posterior, Superior, Inferior, Lateral)	Snell's clinical Anatomy By Regions Edition 2025-26 Page No. 613-622	
F-A-003	Describe the structural classification of Joints (fibrous, cartilaginous and synovial) along with their sub-classifications with examples of each	General Anatomy by Laiq Hussain Siddiqui 7th Edition Page	Joints
	Enlist the general characteristics of synovial joints		

	Enlist the factors stabilizing a synovial joint Describe Hilton's Law	No. 57-75	
F-A-004	Discuss and differentiate the gross features of hyaline, elastic and fibrocartilage	General Anatomy by Laiq Hussain Siddiqui 7th Edition Page No. 54-56	Cartilage
F-A-005	Describe the types of muscular tissue (skeletal, smooth and cardiac)	General Anatomy by Laiq Hussain Siddiqui 7th Edition Page No. 77-79	Myology
	Describe parts of a muscle	General Anatomy by Laiq Hussain Siddiqui 7th Edition Page No. 79-89	
	Classify and exemplify skeletal muscles on the basis of shape, fiber architecture and action	General Anatomy by Laiq Hussain Siddiqui 7th Edition Page No. 89-98	
F-A-006	Describe the two layers of skin (epidermis and dermis)	General Anatomy by Laiq Hussain Siddiqui 7th Edition Page No. 121-126	Integumentary System
(MICROSCOPIC ANATOMY) HISTOLOGY			
CODE	**SPECIFIC LEARNING OUTCOMES**	**Total hours = 21** **BOOK AND PAGE NO.**	**TOPIC**
F-A-006	Describe the electron microscopic structure and fluid mosaic model of plasma membrane	Medical Histology Text & Atlas by Laiq	Cell

		Hussain Siddiqui 9th Edition Page No. 7-11	
	List the membranous and non-membranous cellular organelles of cell	Medical Histology Text & Atlas by Laiq Hussain Siddiqui 9th Edition Page No. 14-24	
	Describe the structure of the cellular organelles and correlate with their functions	Medical Histology Text & Atlas by Laiq Hussain Siddiqui 9th Edition Page No. 14-24	
	Describe the structure of different types of cell junctions	Medical Histology Text & Atlas by Laiq Hussain Siddiqui 9th Edition Page No. 24-27	
	Briefly describe the structure of nucleus	Medical Histology Text & Atlas by Laiq Hussain Siddiqui 9th Edition Page No. 11-13	
F-A-007	Classify and exemplify the epithelia with their histological structure, locations, and functions	Medical Histology Text & Atlas by Laiq Hussain Siddiqui 9th Edition Page No. 35-41, 44-45	Epithelium
	Describe the electron microscopic structure & functions of the following apical cell surface	Medical Histology Text & Atlas by Laiq Hussain	

	specializations: i. Microvilli ii. Stereocilia iii. Cilia	Siddiqui 9th Edition Page No. 41-44	
	Describe the structure of basement membrane	Medical Histology Text & Atlas by Laiq Hussain Siddiqui 9th Edition Page No. 44	
	Classify and exemplify the exocrine glands on the basis of: Shape of secretory portions and ducts mode of secretion and types of secretion and Shape of secretory portions and ducts	Medical Histology Text & Atlas by Laiq Hussain Siddiqui 9th Edition Page No. 47-50	
F-A-008	List the connective tissue cells along with their functions	Medical Histology Text & Atlas by Laiq Hussain Siddiqui 9th Edition Page No. 51-54	Connective Tissue
	Describe the composition of ground substance of connective tissue	Medical Histology Text & Atlas by Laiq Hussain Siddiqui 9th Edition Page No. 55	
	Describe the structure of fibers of connective tissue	Medical Histology Text & Atlas by Laiq Hussain Siddiqui 9th Edition Page No. 55-58	
	Classify connective tissue along with their examples	Medical Histology Text & Atlas by Laiq Hussain Siddiqui 9th Edition Page No. 59-62	
	Draw and label light microscopic diagram of different types of connective tissue		

F-A-009	Describe the microscopic and ultramicroscopic structure of all types of cartilages	Medical Histology Text & Atlas by Laiq Hussain Siddiqui 9th Edition Page No. 63-67	Cartilages
	Draw and label light microscopic diagram of different types of cartilages	Medical Histology Text & Atlas by Laiq Hussain Siddiqui 9th Edition Page No. 63-67	
F-A-010	List the bone cells along with their functions	Medical Histology Text & Atlas by Laiq Hussain Siddiqui 9th Edition Page No. 70-72	Bones
	Describe the composition of bone matrix (organic, inorganic)	Medical Histology Text & Atlas by Laiq Hussain Siddiqui 9th Edition Page No. 69	
	Describe the histology of compact and spongy bone	Medical Histology Text & Atlas by Laiq Hussain Siddiqui 9th Edition Page No. 72-74	
	Draw and label light microscopic diagram of compact and spongy bones	Medical Histology Text & Atlas by Laiq Hussain Siddiqui 9th Edition Page No. 72-74	
F-A-011	Describe the microscopic structure and ultramicroscopic structure of skeletal, cardiac, and smooth muscles	Medical Histology Text & Atlas by Laiq Hussain Siddiqui9th Edition Page	Muscles

		No. 91-100	
F-A-012	Draw and label light microscopic diagram of muscles	Medical Histology Text & Atlas by Laiq Hussain Siddiqui 9th Edition Page No. 91-100	Lymphoid System
	Describe the light microscopic structure of lymphoid organs	Medical Histology Text & Atlas by Laiq Hussain Siddiqui 9th Edition Page No. 139-150	
	Draw and label light microscopic diagram of lymphoid organs	Medical Histology Text & Atlas by Laiq Hussain Siddiqui 9th Edition Page No. 139-150	
F-A-013	Describe the composition of epidermis and dermis	Medical Histology Text & Atlas by Laiq Hussain Siddiqui 9th Edition Page No. 151-162	Skin
	Draw and label light microscopic diagram of thick and thin skin	Medical Histology Text & Atlas by Laiq Hussain Siddiqui 9th Edition Page No. 151-162	

PRACTICAL / LAB WORK of Foundation Module			
MICROSCOPIC ANATOMY (HISTOLOGY)			
CODE	**SPECIFIC LEARNING OUTCOMES**	**TOTAL HOURS =13**	
		BOOK AND PAGE NO.	**TOPIC**
	Identify under a light microscope and draw & label different types of epithelia.		Epithelium
	Identify under a light microscope and draw & label different types of connective tissues.		Connective tissue
	Identify under a light microscope and draw & label different types of cartilages.		Cartilage
	Identify under a light microscope and draw & label compact and spongy bones.		Bone
	Identify under a light microscope and draw & label different types of muscles.		Muscle
	Identify under a light microscope and draw & label lymphoid organs.		Lymphoid organs
	Identify under a light microscope and draw & label thick and thin skin.		Skin

THEORY of Craniofacial 1 Module			
EMBRYOLOGY			
CODE	**SPECIFIC LEARNING OUTCOMES**	**TOTAL HOURS =42**	
		BOOK AND PAGE NO.	**TOPIC**
CF1-A-001	Briefly describe the process of mitosis and meiosis	Langman's Medical Embryology 15th Edition Page No. 15-18	Cell Division

CF1-A-002	Describe the process of oogenesis, including the stages and regulatory mechanisms involved.	Langman's Medical Embryology 15th Edition Page No. 26-33	Gametogenesis
	Describe spermatogenesis and spermiogenesis, highlighting their roles in male fertility.		
	Describe the embryological basis of teratoma.	Langman's Medical Embryology 15th Edition Page No. 14, 67	
CF1-A-003	Discuss the ovarian cycle, hormonal regulation and its phases.	Langman's Medical Embryology 15th Edition Page No. 35-38	First week of development: Ovulation to implantation
	Enlist and explain the main outcomes of fertilization and their relevance to early embryonic development.	Langman's Medical Embryology 15th Edition Page No. 38-45, 47-49	
CF1-A-004	Describe the embryological basis of hydatidiform mole and its pathological significance.	Langman's Medical Embryology 15th Edition Page No. 58	Second week of Development: Bilaminar Germ Disc
	Describe the formation of embryonic disc, amniotic cavity and yolk sac	Langman's Medical Embryology 15th Edition Page No. 51-55	
CF1-A-005	Discuss the process of gastrulation	Langman's Medical Embryology 15th Edition Page No. 60-61	Third Week of Development: Trilaminar Germ Disc
	Discuss the growth and differentiation of the embryonic disc, including the clinical implications of its anomalies.	Langman's Medical Embryology 15th Edition Page No. 68-71,61-66	

	Describe the embryological basis for situs inversus, sirenomelia, holoprosencephaly	Langman's Medical Embryology 15th Edition Page No. 66-68	
	Describe the development of trophoblast during third week of development	Langman's Medical Embryology 15th Edition Page No. 69-71	
CF1-A-006	Explain the stages of neurulation and the formation of the neural tube.	Langman's Medical Embryology 15th Edition Page No. 74-79	Third to Eight Weeks: Embryonic Period
	Describe the process of vasculogenesis and its role in embryonic vascular development.	Langman's Medical Embryology 15th Edition Page No. 86	
	Discuss craniosynostosis (premature closure of sutures) and its impact on skull and brain growth.	Langman's Medical Embryology 15th Edition Page No. 153-154	
CF1-A-007	Discuss the clinical presentation of numerical and structural chromosomal abnormalities	Langman's Medical Embryology 15th Edition Page No. 18-26	Birth Defects

BLOCK 1 - ASSESSMENT PARAMETERS AND DIVISION OF MARKS

ATTENDANCE CRITERIA 90 %
PASSING PERCENTAGE 70%

S.No.	**Subject**	**Theory Exam**	**Oral/ Practical Exam**

		MCQs 1 Mark Each	SEQ (04 Marks each)	Marks	Unobserved OSPE Stations (9 Marks each) (6 minutes each)	OSVE Stations (6 Marks Each) (6 minutes each)	Marks
1	Anatomy	14	1	18	2	1	24

*Student has to pass Theory Exam and Oral/Practical Exam separately

Study Guide Biochemistry

BLOCK-1

Foundation

BIOCHEMISTRY		
CODE	**SPECIFIC LEARNING OUTCOMES**	**RESOURCES**
F.B. 001	Define carbohydrates and their general structure.	Lippincott Illustrated Reviews Biochemistry (8th edition). Emine Ercikan Abali, Susan D. Cline, David S. Franklin, Susan M. Viselli. Wolters Kluwer /Lippincott Williams & Wilkins. Chapter No: 7 Introduction to carbohydrates Page. No: 92 to 95
	Classify carbohydrates into monosaccharides, disaccharides, oligosaccharides, and polysaccharides and their biochemical importance	
	Define carbohydrate isomerism, differentiate between aldo-keto isomers, D & L isomers, epimers, and α & β anomers, and provide suitable examples of each relevant to dentistry (dental caries, salivary glycoproteins)	
	Differentiate between reducing and non-reducing sugars.	
	Define blood glucose levels and identify the normal ranges for fasting, random, and postprandial blood glucose measurements.	Lippincott Illustrated Reviews Biochemistry (8th edition). Emine Ercikan Abali, Susan D. Cline, David S. Franklin, Susan M. Viselli. Wolters Kluwer /Lippincott Williams & Wilkins. Chapter No: 25 Diabetes Mellitus Page. No: 376

	Define glycemic index and evaluate the impact of various dietary carbohydrates on blood sugar levels, highlighting their clinical significance.	Lippincott Illustrated Reviews Biochemistry (8th edition). Emine Ercikan Abali, Susan D. Cline, David S. Franklin, Susan M. Viselli. Wolters Kluwer /Lippincott Williams & Wilkins. Chapter No: 27 Nutrition: Overview & macronutrients Page. No: 410 to 411
F.B. 002	Define amino acids and classify standard amino acids according to side chain and nutritional importance	Lippincott Illustrated Reviews Biochemistry (8th edition). Emine Ercikan Abali, Susan D. Cline, David S. Franklin, Susan M. Viselli. Wolters Kluwer /Lippincott Williams & Wilkins. Chapter No: 1 Amino acids & the role of pH Page. No: 1 to 6 Chapter No: 20 Amino acids: Degradation & synthesis Page. No: 290 to 291
	Define and classify proteins on the based on their functions and axial ratio along with their biological significance	Lippincott Illustrated Reviews Biochemistry (8th edition). Emine Ercikan Abali, Susan D. Cline, David S. Franklin, Susan M. Viselli. Wolters Kluwer /Lippincott Williams & Wilkins. Chapter No: 2 Protein structure
	Explain the levels of protein organization (primary, secondary, tertiary, and quaternary structures) and their relevance to protein function.	

		Page. No: 14 to 23 • Handouts
F.B. 003	Define lipids and their Classification along with their biological importance	A LANGE Medical book Harper's Illustrated Biochemistry (31st edition). Victor W. Rodwell, David A. Bender, Kathleen M. Botham, Peter J. Kennelly, P. Anthony Weil. McGraw-Hill Education. Chapter No: 21 Lipids of physiologic significance Page. No: 195 to 197 • Handouts
F.B. 004	Define and classify vitamins based on their solubility. Briefly explain the active forms, sources, (RDA), biological roles, and associated deficiency disorders of Vitamin B-complex including B1, B2, B3, B6, B9, and B12, vitamin E and Vitamin C in relation to RBC's.	Lippincott Illustrated Reviews Biochemistry (8th edition). Emine Ercikan Abali, Susan D. Cline, David S. Franklin, Susan M. Viselli. Wolters Kluwer /Lippincott Williams & Wilkins. Chapter No: 28 Micronutrients: Vitamins Page. No: 423 to 444 • Handouts
F.B. 005	Define acids, bases, and pH in biological systems. Explain the concept of pH scale and its importance in body fluids. Enlist the buffer systems of the human body and their role in maintenance of homeostasis. Describe the Henderson-Hasselbalch equation and its applications.	A LANGE Medical book Harper's Illustrated Biochemistry (31st edition). Victor W. Rodwell, David A. Bender, Kathleen M. Botham, Peter J. Kennelly, P. Anthony Weil. McGraw-Hill Education.

		Chapter No: 2 Water & pH Page. No: 9 to 13 • Handouts
F.B. 006	Define enzymes and their role in biological reactions.	Lippincott Illustrated Reviews Biochemistry (8th edition). Emine Ercikan Abali, Susan D. Cline, David S. Franklin, Susan M. Viselli. Wolters Kluwer /Lippincott Williams & Wilkins. Chapter No: 5 Enzymes Page. No: 57 to 72
	Classify enzymes with examples of each	
	Explain the properties and mechanism of enzyme	
	Describe the factors affecting enzyme activity and regulation of enzyme	
F.B. 007	Describe the fluid mosaic model of cell membrane	A LANGE Medical book Harper's Illustrated Biochemistry (31st edition). Victor W. Rodwell, David A. Bender, Kathleen M. Botham, Peter J. Kennelly, P. Anthony Weil. McGraw-Hill Education. Chapter No: 40 Membranes: structure & function Page. No: 459 to 466 • Handouts
	Describe the role of cell organelles and describe the technique of subcellular fractionation for separation of cell organelles and enlist marker enzymes for various cell components.	• Handouts
F.B. 008	Define and classify receptors.	A LANGE Medical book Harper's Illustrated Biochemistry (31st edition). Victor W. Rodwell,
	Delineate the sequence of events in the signal	

	transduction pathways involving Gs and Gq proteins.	David A. Bender, Kathleen M. Botham, Peter J. Kennelly, P. Anthony Weil. McGraw-Hill Education. Chapter No: 42 Hormone action & signal transduction Page. No: 500 to 514 • Handouts
F.B. 009	Differentiate between anabolism and catabolism, and list the metabolic pathways associated with each process.	Lippincott Illustrated Reviews Biochemistry (8th edition). Emine Ercikan Abali, Susan D. Cline, David S. Franklin, Susan M. Viselli. Wolters Kluwer /Lippincott Williams & Wilkins. Chapter No: 8 Introduction to metabolism & glycolysis Page. No: 100 to 116
	Outline the steps of glycolysis pathway including regulation of key enzymes with energetics	
	Differentiate between aerobic and anaerobic glycolysis, highlighting the fate of pyruvate in each condition	
F.B. 010	Describe the structure of Heme and briefly describe the steps of Heme synthesis with its regulation.	Lippincott Illustrated Reviews Biochemistry (8th edition). Emine Ercikan Abali, Susan D. Cline, David S. Franklin, Susan M. Viselli. Wolters Kluwer /Lippincott Williams & Wilkins. Chapter No: 21 Amino acids: conversion to specialized products Page. No: 308 to 311
	How does Heme combine with Globin to form Hemoglobin and Enlist the functions of Hemoglobin.	Lippincott Illustrated Reviews Biochemistry (8th edition). Emine

	Enlist the types of hemoglobin along with their percentage and chain composition. Explain the significance of HbA1c.	Ercikan Abali, Susan D. Cline, David S. Franklin, Susan M. Viselli. Wolters Kluwer /Lippincott Williams & Wilkins. Chapter No: 3 Globular proteins Page. No: 26 to 35
	Define and explain the biochemical basis of porphyria along with its classification. Describe the oral and dental manifestations of porphyria, including erythrodontia, photosensitivity, mucosal lesions, and delayed healing.	Lippincott Illustrated Reviews Biochemistry (8th edition). Emine Ercikan Abali, Susan D. Cline, David S. Franklin, Susan M. Viselli. Wolters Kluwer /Lippincott Williams & Wilkins. Chapter No: 21 Amino acids: conversion to specialized products Page. No: 311 to 313
F.B. 011	Describe and outline the steps in Hexose Monophosphate Pathway (HMP) and its significance in RBC's Compare and contrast Glycolysis and the HMP Shunt Explain hemolytic anemia due to pyruvate kinase and glucose 6 phosphate dehydrogenase deficiencies.	Lippincott Illustrated Reviews Biochemistry (8th edition). Emine Ercikan Abali, Susan D. Cline, David S. Franklin, Susan M. Viselli. Wolters Kluwer /Lippincott Williams & Wilkins. Chapter No: 8 Introduction to metabolism & glycolysis Page. No: 113 Lippincott Illustrated Reviews Biochemistry (8th edition). Emine Ercikan Abali, Susan D. Cline, David S. Franklin, Susan M.

		Viselli. Wolters Kluwer /Lippincott Williams & Wilkins. Chapter No: 13 Pentose phosphate pathway & Nicotinamide adenine dinucleotide phosphate Page. No: 160 to 170.
F.B. 012	Understand the oxygen-binding mechanism of hemoglobin, including the concepts of cooperative binding and allosteric regulation. Explain and draw the oxygen-hemoglobin dissociation curve for hemoglobin. Give biochemical explanation for abnormally high oxygen affinity of hemoglobin in the stored blood.	Lippincott Illustrated Reviews Biochemistry (8^{th} edition). Emine Ercikan Abali, Susan D. Cline, David S. Franklin, Susan M. Viselli. Wolters Kluwer /Lippincott Williams & Wilkins. Chapter No: 3 Globular proteins Page. No: 29 to 34
F.B. 013	Describe the biochemical role of Selenium and Iron in RBC function, antioxidant defense, and erythropoiesis.	Lippincott Illustrated Reviews Biochemistry (8^{th} edition). Emine Ercikan Abali, Susan D. Cline, David S. Franklin, Susan M. Viselli. Wolters Kluwer /Lippincott Williams & Wilkins. Chapter No: 29 Micronutrients: Minerals Page. No: 450 to 451, 454.

BIOCHEMISTRY

Cariology-I

BIOCHEMISTRY		
CODE	**SPECIFIC LEARNING OUTCOMES**	**RESOURCES**
Car1-B-001	Explain the biochemical properties of sucrose, glucose, and fructose.	Lippincott Illustrated Reviews Biochemistry (8th edition). Emine Ercikan Abali, Susan D. Cline, David S. Franklin, Susan M. Viselli. Wolters Kluwer /Lippincott Williams & Wilkins. Chapter No: 7 Introduction to carbohydrates Page. No: 92 to 95
	Compare the cariogenic potential of sucrose, glucose, and starch.	CAWSON'S essentials of oral pathology and oral medicine (9th edition) E.W. Odell. Elsevier Ltd. Chapter 4 Page:59
Car1-B-002	Define dental plaque and explain its composition.	CAWSON'S essentials of oral pathology and oral medicine (9th edition) E.W. Odell. Elsevier Ltd. Chapter 4

		Page:53-70
	Discuss the role of sucrose in synthesizing extracellular polysaccharides (e.g., glucans via glucosyltransferases) and their contribution to plaque biofilm adhesion and stability	Oral Biology. (3rd edition) B. K. B. Berkovitz, R. W. A. Linden, B. J. Moxham, A. J. Sloan. Elsevier Ltd. Chapter 8 Page:95-96
	Discuss the impact of diet, pH, and host factors on plaque development.	CAWSON'S essentials of oral pathology and oral medicine (9th edition) E.W. Odell. Elsevier Ltd. Chapter 4 Page:53-70
Car1-B-003	Illustrate the glycolytic pathway in cariogenic bacteria and its role in acid production.	CAWSON'S essentials of oral pathology and oral medicine (9th edition) E.W. Odell. Elsevier Ltd. Chapter 4 Page:56-57
	Explain the process of lactic acid fermentation, including the conversion of pyruvate into organic acids.	Jawetz, Melnick, & Adelberg's Medical Microbiology (28th Edition). McGraw-Hill Education. Chapter 6 Page:99-100
	Explain the concept of acidogenicity and aciduricity in cariogenic bacteria.	Jawetz, Melnick, & Adelberg's Medical Microbiology (28th Edition). McGraw-Hill Education. Chapter 10

		Page:175-176
Car1-B-004	Define Critical pH. Relate the critical pH for enamel demineralization (5.5 for enamel and 6.2 for dentine) to acid production and the role of saliva in buffering pH and supplying calcium/phosphate for remineralization. Identify and analyze the components of saliva (salivary proteins, enzymes, bicarbonate, statherin, lysozyme, lactoferrin, amylase, histatins) and their functions in maintaining oral pH and enamel repair.	CAWSON'S essentials of oral pathology and oral medicine (9th edition) E.W. Odell. Elsevier Ltd. Chapter 4 Page:53-70
Car1-B-005	Describe the buffering action of saliva (bicarbonate, phosphate, and protein buffers).	CAWSON'S essentials of oral pathology and oral

	Discuss factors that affect salivary flow and pH regulation. Explain the role of carbonic anhydrase in maintaining oral pH.	medicine (9th edition) E.W. Odell. Elsevier Ltd. Chapter 4 Page:53-70
Car1-B-006	Discuss how fluoride disrupts bacterial glycolysis and acid production.	Lippincott Illustrated Reviews Biochemistry (8th edition). Emine Ercikan Abali, Susan D. Cline, David S. Franklin, Susan M. Viselli. Wolters Kluwer /Lippincott Williams & Wilkins. Chapter No: 8 Introduction to metabolism & glycolysis Page. No: 112
Car1-B-007	Compare the metabolism of sugar alcohols (xylitol, sorbitol) versus fermentable sugars in the oral cavity. Explain the mechanism by which xylitol inhibits *Streptococcus mutans* growth and acid production.	Sturdevant's Art and Science of Operative Dentistry (7th edition) André V. Ritter, Lee W. Boushell, Ricardo Walter. Elsevier Ltd. Chapter 2 Page:85

PHYSIOLOGY BDS 2025

Code	PHYSIOLOGY THEORY (21 hours)		
	SPECIFIC LEARNING OBJECTIVES	Book	Page#
F-P-001	Define Homeostasis	Guyton 14th ed (e book) Chapter 1	3-4
	Describe internal environment of the body		3-4
	Differentiate between Extracellular and Intracellular Fluids (with special emphasis on comparing the concentration of sodium, potassium, and calcium ions)		3-4 & 51
F-P-002	Name control system of body by giving examples		7-10
	Explain the positive, negative, and feed-forward mechanisms with examples		7-10
F-P-003	Discuss organization of the cell		13-14
	Explain the structure and functions of the cell membrane	Guyton 14th ed (e book) Chapter 2	14-16
	Enlist the functions of Glycocalyx		14-16
	Name different proteins of the cell membrane with their functions		14-16
	Enlist membranous and non-membranous organelles		16
	Enlist the self-replicative organelles		16
	Differentiate between the functions of smooth and rough endoplasmic reticulum		16-25
	Explain the functions of Golgi apparatus		
	Explain the functions of lysosomes		
	Explain the functions of peroxisomes		
	Compare functions of lysosomes and peroxisomes		
	Enlist functions of mitochondria and ribosomes		
	Enumerate the components and functions of the cytoskeleton		

F-P-004	Define and enlist types of endocytosis		21-22
	Explain the mechanism of pinocytosis		
F-P-005	Enlist different transport mechanisms		
	Discuss the process of simple diffusion across the cell membrane	Guyton 14th ed (e book) Chapter 4	51-54
	Explain the process of facilitated diffusion		55-56
	Compare features of simple and facilitated diffusion with examples		
	Classify different types of active transport		58-61
	Describe primary and secondary active transport with examples		
	Enlist and explain functions of Na-K pump		
F-P-006	Discuss the components of blood	Sherwood 9th ed (e book) Chapter 11	381-383
	Enlist the functions of blood		
	Enlist plasma proteins		
	Enumerate the different sites of erythropoiesis at different ages	Guyton 14th ed (e book) Chapter 33	439-440
	Enlist the stages of erythropoiesis		441
	Discuss characteristics of red cells	Guyton 14th ed (e book) Chapter 33	439, 441
	Give normal range of red cells in blood, also their shape and size		439
	Define blood indices mentioned as: MCV (mean corpuscular volume), MCH (mean corpuscular	Ganong's Review of Medical	1259-1260

	hemoglobin), and MCHC (mean corpuscular hemoglobin concentration). Give their normal values & enumerate the conditions in which these values are disturbed	Physiology 26th ed (e book) Chapter 31	
	Discuss functions of red cells		439
	Discuss the site and mechanism of production of erythropoietin and its role in erythropoiesis	Guyton 14th ed (e book) Chapter 33	439-443
	Explain the significance of vitamin B12 and folic acid in maturation of red blood cells		439-443
	Enumerate and elaborate role of factors/nutrients that are required and regulate erythropoiesis	Guyton 14th ed (e book) Chapter 33	439-443
	Discuss components/structure of hemoglobin	same	443-444
	Define sickle cell anemia	Guyton 14th ed (e book) Chapter 33	443-444
	Discuss fate of red cells when they complete their life span	Guyton 14th ed (e book) Chapter 33	445
	Define and classify anemia on the basis of morphology and cause.	Guyton 14th ed (e book) Chapter 33	446
	Discuss the effects of anemia on circulation	Guyton 14th ed (e book) Chapter 33	446-447
	Define and enlist types of polycythemias		447
	Discuss the effects of polycythemias on circulation		

Sr. No	**PHYSIOLOGY PRACTICALS (5 hours)**		
1.	Parts of Microscope and their functions How to operate it?	Hand outs	
2.	How to obtain verbal consent from subject before drawing blood for CBC testing.	Hand outs	
3.	Interpret the RBC count, hemoglobin concentration and hematocrit in the CBC report generated by automated Analyzer	Hand outs	
4.	Read and interpret ESR result on Westergen's tube and mentions conditions in which ESR is increased or decreased physiologically and pathologically.	Hand outs	

Guyton AC and Hall JE. Textbook of Medical Physiology 14th ed

BIOCHEMISTRY

BLOCK-1

Foundation

BIOCHEMISTRY		
CODE	**SPECIFIC LEARNING OUTCOMES**	**RESOURCES**
F.B. 001	Define carbohydrates and their general structure.	Lippincott Illustrated Reviews Biochemistry (8th edition). Emine Ercikan Abali, Susan D. Cline, David S. Franklin, Susan M. Viselli. Wolters Kluwer /Lippincott Williams & Wilkins. Chapter No: 7 Introduction to carbohydrates Page. No: 92 to 95
	Classify carbohydrates into monosaccharides, disaccharides, oligosaccharides, and polysaccharides and their biochemical importance	
	Define carbohydrate isomerism, differentiate between aldo-keto isomers, D & L isomers, epimers, and α & β anomers, and provide suitable examples of each relevant to dentistry (dental caries, salivary glycoproteins)	
	Differentiate between reducing and non-reducing sugars.	
	Define blood glucose levels and identify the normal ranges for fasting, random, and postprandial blood glucose measurements.	Lippincott Illustrated Reviews Biochemistry (8th edition). Emine Ercikan Abali, Susan D. Cline, David S. Franklin, Susan M. Viselli. Wolters Kluwer /Lippincott Williams & Wilkins. Chapter No: 25 Diabetes Mellitus Page. No: 376

	Define glycemic index and evaluate the impact of various dietary carbohydrates on blood sugar levels, highlighting their clinical significance.	Lippincott Illustrated Reviews Biochemistry (8th edition). Emine Ercikan Abali, Susan D. Cline, David S. Franklin, Susan M. Viselli. Wolters Kluwer /Lippincott Williams & Wilkins. Chapter No: 27 Nutrition: Overview & macronutrients Page. No: 410 to 411
F.B. 002	Define amino acids and classify standard amino acids according to side chain and nutritional importance	Lippincott Illustrated Reviews Biochemistry (8th edition). Emine Ercikan Abali, Susan D. Cline, David S. Franklin, Susan M. Viselli. Wolters Kluwer /Lippincott Williams & Wilkins. Chapter No: 1 Amino acids & the role of pH Page. No: 1 to 6 Chapter No: 20 Amino acids: Degradation & synthesis Page. No: 290 to 291
	Define and classify proteins on the based on their functions and axial ratio along with their biological significance	Lippincott Illustrated Reviews Biochemistry (8th edition). Emine Ercikan Abali, Susan D. Cline, David S. Franklin, Susan M. Viselli. Wolters Kluwer /Lippincott Williams & Wilkins. Chapter No: 2 Protein structure
	Explain the levels of protein organization (primary, secondary, tertiary, and quaternary structures) and their relevance to protein function.	

		Page. No: 14 to 23 • Handouts
F.B. 003	Define lipids and their Classification along with their biological importance	A LANGE Medical book Harper's Illustrated Biochemistry (31st edition). Victor W. Rodwell, David A. Bender, Kathleen M. Botham, Peter J. Kennelly, P. Anthony Weil. McGraw-Hill Education. Chapter No: 21 Lipids of physiologic significance Page. No: 195 to 197 • Handouts
F.B. 004	Define and classify vitamins based on their solubility. Briefly explain the active forms, sources, (RDA), biological roles, and associated deficiency disorders of Vitamin B-complex including B1, B2, B3, B6, B9, and B12, vitamin E and Vitamin C in relation to RBC's.	Lippincott Illustrated Reviews Biochemistry (8th edition). Emine Ercikan Abali, Susan D. Cline, David S. Franklin, Susan M. Viselli. Wolters Kluwer /Lippincott Williams & Wilkins. Chapter No: 28 Micronutrients: Vitamins Page. No: 423 to 444 • Handouts
F.B. 005	Define acids, bases, and pH in biological systems. Explain the concept of pH scale and its importance in body fluids. Enlist the buffer systems of the human body and their role in maintenance of homeostasis. Describe the Henderson-Hasselbalch equation and its applications.	A LANGE Medical book Harper's Illustrated Biochemistry (31st edition). Victor W. Rodwell, David A. Bender, Kathleen M. Botham, Peter J. Kennelly, P. Anthony Weil. McGraw-Hill Education.

		Chapter No: 2 Water & pH Page. No: 9 to 13 • Handouts
F.B. 006	Define enzymes and their role in biological reactions.	Lippincott Illustrated Reviews Biochemistry (8th edition). Emine Ercikan Abali, Susan D. Cline, David S. Franklin, Susan M. Viselli. Wolters Kluwer /Lippincott Williams & Wilkins. Chapter No: 5 Enzymes Page. No: 57 to 72
	Classify enzymes with examples of each	
	Explain the properties and mechanism of enzyme	
	Describe the factors affecting enzyme activity and regulation of enzyme	
F.B. 007	Describe the fluid mosaic model of cell membrane	A LANGE Medical book Harper's Illustrated Biochemistry (31st edition). Victor W. Rodwell, David A. Bender, Kathleen M. Botham, Peter J. Kennelly, P. Anthony Weil. McGraw-Hill Education. Chapter No: 40 Membranes: structure & function Page. No: 459 to 466 • Handouts
	Describe the role of cell organelles and describe the technique of subcellular fractionation for separation of cell organelles and enlist marker enzymes for various cell components.	• Handouts
F.B. 008	Define and classify receptors.	A LANGE Medical book Harper's Illustrated Biochemistry (31st edition). Victor W. Rodwell,
	Delineate the sequence of events in the signal	

	transduction pathways involving Gs and Gq proteins.	David A. Bender, Kathleen M. Botham, Peter J. Kennelly, P. Anthony Weil. McGraw-Hill Education. Chapter No: 42 Hormone action & signal transduction Page. No: 500 to 514 • Handouts
F.B. 009	Differentiate between anabolism and catabolism, and list the metabolic pathways associated with each process.	Lippincott Illustrated Reviews Biochemistry (8th edition). Emine Ercikan Abali, Susan D. Cline, David S. Franklin, Susan M. Viselli. Wolters Kluwer /Lippincott Williams & Wilkins. Chapter No: 8 Introduction to metabolism & glycolysis Page. No: 100 to 116
	Outline the steps of glycolysis pathway including regulation of key enzymes with energetics	
	Differentiate between aerobic and anaerobic glycolysis, highlighting the fate of pyruvate in each condition	
F.B. 010	Describe the structure of Heme and briefly describe the steps of Heme synthesis with its regulation.	Lippincott Illustrated Reviews Biochemistry (8th edition). Emine Ercikan Abali, Susan D. Cline, David S. Franklin, Susan M. Viselli. Wolters Kluwer /Lippincott Williams & Wilkins. Chapter No: 21 Amino acids: conversion to specialized products Page. No: 308 to 311
	How does Heme combine with Globin to form Hemoglobin and Enlist the functions of Hemoglobin.	Lippincott Illustrated Reviews Biochemistry (8th edition). Emine

	Enlist the types of hemoglobin along with their percentage and chain composition. Explain the significance of HbA1c.	Ercikan Abali, Susan D. Cline, David S. Franklin, Susan M. Viselli. Wolters Kluwer /Lippincott Williams & Wilkins. Chapter No: 3 Globular proteins Page. No: 26 to 35
	Define and explain the biochemical basis of porphyria along with its classification. Describe the oral and dental manifestations of porphyria, including erythrodontia, photosensitivity, mucosal lesions, and delayed healing.	Lippincott Illustrated Reviews Biochemistry (8th edition). Emine Ercikan Abali, Susan D. Cline, David S. Franklin, Susan M. Viselli. Wolters Kluwer /Lippincott Williams & Wilkins. Chapter No: 21 Amino acids: conversion to specialized products Page. No: 311 to 313
F.B. 011	Describe and outline the steps in Hexose Monophosphate Pathway (HMP) and its significance in RBC's Compare and contrast Glycolysis and the HMP Shunt Explain hemolytic anemia due to pyruvate kinase and glucose 6 phosphate dehydrogenase deficiencies.	Lippincott Illustrated Reviews Biochemistry (8th edition). Emine Ercikan Abali, Susan D. Cline, David S. Franklin, Susan M. Viselli. Wolters Kluwer /Lippincott Williams & Wilkins. Chapter No: 8 Introduction to metabolism & glycolysis Page. No: 113 Lippincott Illustrated Reviews Biochemistry (8th edition). Emine Ercikan Abali, Susan D. Cline, David S. Franklin, Susan M.

		Viselli. Wolters Kluwer /Lippincott Williams & Wilkins. Chapter No: 13 Pentose phosphate pathway & Nicotinamide adenine dinucleotide phosphate Page. No: 160 to 170.
F.B. 012	Understand the oxygen-binding mechanism of hemoglobin, including the concepts of cooperative binding and allosteric regulation. Explain and draw the oxygen-hemoglobin dissociation curve for hemoglobin. Give biochemical explanation for abnormally high oxygen affinity of hemoglobin in the stored blood.	Lippincott Illustrated Reviews Biochemistry (8th edition). Emine Ercikan Abali, Susan D. Cline, David S. Franklin, Susan M. Viselli. Wolters Kluwer /Lippincott Williams & Wilkins. Chapter No: 3 Globular proteins Page. No: 29 to 34
F.B. 013	Describe the biochemical role of Selenium and Iron in RBC function, antioxidant defense, and erythropoiesis.	Lippincott Illustrated Reviews Biochemistry (8th edition). Emine Ercikan Abali, Susan D. Cline, David S. Franklin, Susan M. Viselli. Wolters Kluwer /Lippincott Williams & Wilkins. Chapter No: 29 Micronutrients: Minerals Page. No: 450 to 451, 454.

Cariology-I

BIOCHEMISTRY		
CODE	**SPECIFIC LEARNING OUTCOMES**	**RESOURCES**
Car1-B-001	Explain the biochemical properties of sucrose, glucose, and fructose.	Lippincott Illustrated Reviews Biochemistry (8th edition). Emine Ercikan Abali, Susan D. Cline, David S. Franklin, Susan M. Viselli. Wolters Kluwer /Lippincott Williams & Wilkins. Chapter No: 7 Introduction to carbohydrates Page. No: 92 to 95
	Compare the cariogenic potential of sucrose, glucose, and starch.	CAWSON'S essentials of oral pathology and oral medicine (9th edition) E.W. Odell. Elsevier Ltd. Chapter 4 Page:59
Car1-B-002	Define dental plaque and explain its composition.	CAWSON'S essentials of oral pathology and oral medicine (9th edition) E.W. Odell. Elsevier Ltd. Chapter 4 Page:53-70
	Discuss the role of sucrose in synthesizing	Oral Biology. (3rd edition)

	extracellular polysaccharides (e.g., glucans via glucosyltransferases) and their contribution to plaque biofilm adhesion and stability	B. K. B. Berkovitz, R. W. A. Linden, B. J. Moxham, A. J. Sloan. Elsevier Ltd. Chapter 8 Page:95-96
	Discuss the impact of diet, pH, and host factors on plaque development.	CAWSON'S essentials of oral pathology and oral medicine (9th edition) E.W. Odell. Elsevier Ltd. Chapter 4 Page:53-70
Car1-B-003	Illustrate the glycolytic pathway in cariogenic bacteria and its role in acid production.	CAWSON'S essentials of oral pathology and oral medicine (9th edition) E.W. Odell. Elsevier Ltd. Chapter 4 Page:56-57
	Explain the process of lactic acid fermentation, including the conversion of pyruvate into organic acids.	Jawetz, Melnick, & Adelberg's Medical Microbiology (28th Edition). McGraw-Hill Education. Chapter 6 Page:99-100
	Explain the concept of acidogenicity and aciduricity in cariogenic bacteria.	Jawetz, Melnick, & Adelberg's Medical Microbiology (28th Edition). McGraw-Hill Education. Chapter 10 Page:175-176

Car1-B-004	Define Critical pH. Relate the critical pH for enamel demineralization (5.5 for enamel and 6.2 for dentine) to acid production and the role of saliva in buffering pH and supplying calcium/phosphate for remineralization. Identify and analyze the components of saliva (salivary proteins, enzymes, bicarbonate, statherin, lysozyme, lactoferrin, amylase, histatins) and their functions in maintaining oral pH and enamel repair.	CAWSON'S essentials of oral pathology and oral medicine (9th edition) E.W. Odell. Elsevier Ltd. Chapter 4 Page:53-70
Car1-B-005	Describe the buffering action of saliva (bicarbonate, phosphate, and protein buffers). Discuss factors that affect salivary flow and pH regulation. Explain the role of carbonic anhydrase in maintaining oral pH.	CAWSON'S essentials of oral pathology and oral medicine (9th edition) E.W. Odell. Elsevier Ltd. Chapter 4 Page:53-70
Car1-B-006	Discuss how fluoride disrupts bacterial glycolysis and acid production.	Lippincott Illustrated Reviews Biochemistry (8th edition). Emine Ercikan Abali, Susan D. Cline, David S. Franklin, Susan M. Viselli. Wolters Kluwer /Lippincott Williams & Wilkins. Chapter No: 8 Introduction to metabolism & glycolysis Page. No: 112
Car1-B-007	Compare the metabolism of sugar alcohols (xylitol, sorbitol) versus fermentable sugars in the oral cavity. 	Sturdevant's Art and Science of Operative Dentistry (7th edition)

	Explain the mechanism by which xylitol inhibits *Streptococcus mutans* growth and acid production.	André V. Ritter, Lee W. Boushell, Ricardo Walter. Elsevier Ltd. Chapter 2 Page:85

STUDY GUIDE OF ORAL BIOLOGY

Block 1: Foundation Total Hours = 22+12

Block 1: Craniofacial Total Hours = 39+7

Block 1: Cariology Total Hours = 25+15

Total Block 1 (86T+34P) =120

ORAL BIOLOGY			
CODE	**SPECIFIC LEARNING OUTCOMES**	**TOTAL HOURS = 22**	
		BOOK AND PAGE NO.	**TOPIC**
F-OB-001	The Tooth	Ten Cate 9TH Edition Chapter 1 page 1-11	Structure of Oral Tissues (An Brief Introduction)
	Supporting Tissues of the Tooth		
	Oral Mucosa		
	Salivary Glands		
	Bones of the Jaw		
	Temporomandibular Joint		
	Hard Tissue Formation		
	Mineralization		
	Hard Tissue Degradation		
	Enamel		
	Dentine		
	Cementum		
	Periodontal Ligament		

F-OB-002	Describe the structure, types, and functions of the cytoskeleton, including microfilaments, intermediate filaments, and microtubules, within oral tissues.	Ten Cate 9TH Edition Chapter 4 Page 42	Cytoskeleton
F-OB-003	Classify and explain the functions of intercellular junctions, including tight junctions, adherent's junctions, desmosomes, and gap junctions, in oral epithelial tissues.	Ten Cate 9TH Edition Chapter 4 Page 42-46	Cell Junctions
	Illustrate the structural features and functions of desmosomes and hemidesmosomes in maintaining the integrity of oral epithelial tissues.	Ten Cate 9TH Edition Chapter 4 Page 45 Fig 4.6C	
F-OB-004	Describe the structure, secretory functions, and role of fibroblasts in the maintenance of the extracellular matrix in oral tissues	Ten Cate 9TH Edition Chapter 4 Page 46,47and 50	Fibroblast
	Explain the steps involved in collagen synthesis and assembly, highlighting its importance in oral connective tissue.	Ten Cate 9TH Edition Chapter 4 Page 54	
F-OB-005	Discuss the composition, function, and degradation processes of the extracellular matrix, emphasizing its role in oral tissue integrity and repair.	Ten Cate 9TH Edition Chapter 4 Page 58,59	Extracellular Matrix
F-OB-006	Name the three major functions of the human dentition	Concise Dental Anatomy and morphology By Fuller ,5Th Edition Unit 1Page 3	Introduction and Nomenclature

	Describe various ways of classifying human dentition.	Concise Dental Anatomy and morphology By Fuller ,5Th Edition Unit 1Page 3 to 5	
	Define the three dentition periods (deciduous, mixed, permanent).Identify each period's approximate time intervals, initiation, and termination events	Concise Dental Anatomy and morphology By Fuller ,5Th Edition Unit 1Page 5 to 7	
	Describe the dental Formula for permanent and Deciduous dentition	Concise Dental Anatomy and morphology By Fuller ,5Th Edition Page 5	
	Define "succedaneous" and identify succedaneous teeth	Concise Dental Anatomy and morphology By Fuller ,5Th Edition Page 4	
	Describe the eruption pattern of primary and permanent dentition	Concise Dental Anatomy and morphology By Fuller ,5Th Edition Unit 1Page 5 to 7	
	Demonstrate understanding of various dental numbering systems (e.g., universal, FDI, Palmer).	Concise Dental Anatomy and morphology By Fuller ,5Th Edition Unit 1Page 7 to	

		11	
	Describe the anatomical surfaces and land marks of both anterior and posterior teeth, including the roots, using standardized dental terminology.	Concise Dental Anatomy and morphology By Fuller ,5Th Edition Unit 1Page 7 to 11	
	Identify and name tooth surfaces and thirds of tooth surfaces from diagrams or descriptions	Concise Dental Anatomy and morphology By Fuller ,5Th Edition Page 11 to 17	
	Differentiate between the crown surfaces of teeth by matching them with their correct general shape (triangular, trapezoidal, or rhomboidal), or by relating the shape to the specific function of the tooth.	Concise Dental Anatomy and morphology By Fuller ,5Th Edition Unit 2 Page 28-29	
	Identify and name line and point angles based on diagrams or descriptions.	Concise Dental Anatomy and morphology By Fuller ,5Th Edition unit 1 Page 14 and 15	
	Define elevations and depressions on the tooth surface.	Concise Dental Anatomy and morphology By Fuller ,5Th Edition unit 1 Page 18 to 20	
	Applications to the type of root structure necessary for proper the function of the different teeth, and the general rules regarding tooth roots and the normal number of branches.	Concise Dental Anatomy and morphology By Fuller ,5Th Unit 2 Page 38	

ORAL BIOLOGY AND TOOTH MORPHOLOGY		
CODE	**SPECIFIC LEARNING OUTCOMES**	**TOTAL HOURS =12**

		BOOK AND PAGE NO	TOPIC
	List all structures of a tooth. Identify, draw, and label structures of the tooth on models.	Ten Cate 9TH Edition Chapter1 page 2 Fig 1	Enamel, Dentine, Pulp, Cementum, Periodontal Ligament, Salivary gland, TMJ, Oral Mucosa.
	Identify and differentiate, on tooth specimen/models/images: anatomical crown, clinical crown, anatomical root, clinical root, enamel, dentin, cementum, cervical line, pulp cavity, cusps, tubercles, cingulum, ridges (marginal, triangular, transverse, oblique and cusp ridges), inclined plane, mamelons, fossa, developmental (primary) groove, supplemental (secondary) groove, line angles, point angles, and tooth surfaces (mesial, distal, lingual/palatal, Buccal/labial, incisal/occlusal),	Concise Dental Anatomy and morphology By Fuller ,5Th Edition Unit 1 Page 18 to 20	Introduction & Nomenclature of tooth
	Carve tooth models in wax/soap (one anterior & one posterior) and demonstrate the morphological features.		
	Identify & number different teeth according to universal, palmar notation & FDI numbering systems	Concise Dental Anatomy and morphology By Fuller ,5Th Edition Unit 1 Page 7 to 11	
	Draw & label the diagram of cytoskeletal elements.	Ten Cate 9TH Edition Chapter 4 Fig 4.2 A 4.3 A 4.4 A Page 43,44	Cytoskeleton
	Draw & label the diagram of tight junctions, desmosomes,,hemidesmosomes, and gap junctions.	Ten Cate 9TH Edition Chapter 4 Fig 4.6 A,B,C and 4.8 B 4.9 C Page 45 47	Cell Junctions

		49	
	Draw and label steps of collagen synthesis and assembly	Ten Cate 9TH Edition Chapter 4 Fig 4.14 page 55	Fibroblast

Cranio-facial Module 1

ORAL BIOLOGY			
CODE	**SPECIFIC LEARNING OUTCOMES**	**TOTAL HOURS = 39**	
		BOOK AND PAGE NO	**TOPIC**
CF1-OB-001	Describe the origin, migration, and differentiation of neural crest cells, and explain their contributions to the formation of bone, cartilage, connective tissues in craniofacial development and the associated development defects.	Ten Cate 9TH Edition Ch 2 Page 17-20	Neural Crest Cells and Head Formation
CF1-OB-002	Describe the formation, organization, and derivatives (muscles, nerves, skeletal structures) of the five pharyngeal (branchial) arches and its clinical implications Identify the embryological contributions of the pharyngeal pouches, grooves, and membranes and its clinical implications (Branchial Cleft Cysts and Fistulas).	Ten Cate 9TH Edition Ch 2 Page 23-28 Table 3.1 ,3.2	Branchial (Pharyngeal) Arches and the Primitive Mouth
CF1-OB-003	Describe the key facial prominences (frontonasal, maxillary, and mandibular) and their fusion process in forming the forehead, nose, upper lip, and jaw. Discuss the critical periods of facial development, teratogenic factors disrupting it, and the clinical	Ten Cate 9TH Edition Ch 3 Page 28,29	Formation of the Face

	implications of improper facial fusion, including anomalies like cleft lip and midline facial clefts		
CF1-OB-004	Describe the development of the primary and secondary palate, including the growth, elevation, and fusion of palatal shelves, and discuss the molecular signals involved in palatal development and its clinical implications due to non- fusion like Cleft Palate including the teratogenic factors that cause it.	Ten Cate 9TH Edition Ch 3 Page 29,33	Formation of the Palate
CF1-OB-005	Describe the embryonic development of the tongue, contributions of key structures (lateral lingual swellings, tuberculum impar, copula), muscle derivation, and sensory/motor innervation and Developmental Defects associated with it like ankyloglossia	Ten Cate 9TH Edition Ch 3 Page 34	Formation of the Tongue
CF1-OB-006	Explain the two types of ossification: intramembranous (flat bones) and endochondral (base of the skull).	Ten Cate 9TH Edition Ch 6 Page 105 to 111	Development of the Mandible and Maxilla
	Describe the role of Meckel's cartilage in mandibular development and the process of intramembranous ossification in forming the mandible and maxilla.	Ten Cate 9TH Edition Ch 3 Page36 to 39	
	Define jaw size anomalies and their embryological basis and clinical impact (Micrognathia and Macrognathia).		
CF1-OB-007	Describe the development of the temporomandibular joint (TMJ), including the role of secondary cartilage, and potential developmental disorders (congenital dislocation, condylar hypoplasia	Ten Cate 9TH Edition Ch 3 Page 39	Development of the Temporomandibular Joint (TMJ)

CF1-OB-008	Describe the formation of the primary epithelial band and its role in initiating tooth development.	Ten Cate 9TH Edition Ch 5 Page 68 and 71	Early Tooth Development
	Explain the process of tooth initiation and the molecular signals involved in odontogenesis.	Ten Cate 9TH Edition Ch 5 Page 71to 74 Table 5.2	
	Discuss the determination of different tooth types based on patterning signals in the oral ectoderm.	Ten Cate 9TH Edition Ch 5 Page 74 to 77	
CF1-OB-009	Describe the histological and morphological changes that occur during the budstage of tooth development	Ten Cate 9TH Edition Ch 5 page 76-77	Stages of Tooth Development
	Explain the bud-to-cap transition and the role of epithelial-mesenchymal interactions in tooth differentiation.	Ten Cate 9TH Edition Ch 5 page 76-77	
	Describe the histological and morphological changes that occur during the capstage of tooth development.	Ten Cate 9TH Edition Ch 5 page 77 to 79	
	Describe the histological and morphological changes that occur during the bellstage of tooth development.	Ten Cate 9TH Edition Ch 5 page 77 to 79	
	Describe the role of signaling centers such as the enamel knot in controlling tooth shape and structure.	Ten Cate 9TH Edition Ch 5 page 77 to 79	
CF1-OB-010	Explain the process of hard tissue formation, including enamel, dentin, and cementum development in reference to late bell stage of the tooth development	Ten Cate 9TH Edition Ch 5 page 79 to 83	Neural and Vascular Contributions
CF1-OB-011	Describe the role of nerve innervation and vascularization during early tooth development and how they contribute to tissue differentiation.	Ten Cate 9TH Edition Ch 5 page 82 and 83	Formation of the Permanent Dentition

CF1-OB-012	Discuss the mechanisms of root development and the role of Hertwig's epithelial root sheath (HERS) in determining root length and shape.	Ten Cate 9TH Edition Ch 5 page 84 to 86	Hard Tissue and Root Formation
	Describe the formation of the supporting tissues of the tooth, including the periodontal ligament, cementum, and alveolar bone in reference to late bell stage	Ten Cate 9TH Edition Ch 5 page 84 to 86	
CF1-OB-013	Differentiate between the development of primary and permanent dentition and explain the timing of their formation.	Ten Cate 9TH Edition Ch 5 page 83 and 84	Primary and Permanent Dentition
CF1-OB-014	Enlist, Define and Identify developmental Anamolies in Tooth Number	Concise Dental Anatomy and morphology By Fuller ,5Th Edition Unit 11 page 192 -194	Developmental Anomalies related to Tooth Development and Dental Structures
	Enlist, Define and Identify developmental Anamolies related to Tooth Size	Concise Dental Anatomy and morphology By Fuller ,5Th Edition Unit 11 page 192 -194	

PRACTICAL / LAB WORK

ORAL BIOLOGY & TOOTH MORPHOLOGY

CODE	SPECIFIC LEARNING OUTCOMES	TOTAL HOURS =07

		BOOK AND PAGE NO	TOPIC
CF1-OB-015	Identify the congenital defects (cleft lip and palate,) on pictures/models:	Ten Cate 9TH Edition Ch 3 Fig 3.33 and 3.34	Development of Human embryo with special emphasis on tooth-related structures.
	Identify the common tongue anomalies on pictures/models: Aglossia, micro/ macroglossia, fissured tongue, cleft tongue, bifid tongue, tongue tie		
CF1-OB-017	Draw and label different stages of tooth development	Ten Cate 9TH Edition Ch 5 Fig 5.11,5.12,5.13 5.15 5.19 5.20	Tooth Development
	Draw and label the root formation of single-rooted and multi-rooted teeth	Ten Cate 9TH Edition Ch 5 Fig 5.27 and 5.28	

THEORY			
ORAL BIOLOGY			
CODE	**SPECIFIC LEARNING OUTCOMES**	**TOTAL HOURS = 25**	
		BOOK AND PAGE NO	**TOPIC**
Car1-OB-001	Describe the physical & chemical properties of enamel	Ten Cate 9TH Edition Ch 7 Page 118	Enamel
	Describe the structural organization of enamel and Identify the enamel on radiograph	Ten Cate 9TH Edition Ch 7 Page 118,121 122	
	Describe the Differentiation of ameloblasts with reference to reciprocal induction	Ten Cate 9TH Edition CH 5 Page 85	
	Describe the life cycle of Ameloblast	Ten Cate 9TH Edition Ch 7 Page 125 Fig 7.14	
	Enlist the stages of Amelogenesis and describe the pre secretory stage	Ten Cate 9TH Edition Ch 7 Page 128	
	Describe the secretory stage of amelogenesis and role of Tom's process	Ten Cate 9TH Edition Ch 7 Page 131 to 133	
	Describe the maturative stage of amelogenesis and process of modulation	Ten Cate 9TH Edition Ch 7 Page 133 to 140	
	Classify enamel proteins according to their function during amelogenesis	Ten Cate 9TH Edition Ch 7 Page 141-147	

		Table 7.2	
	Describe the regulation of pH during enamel formation	Ten Cate 9TH Edition Ch 7 Page 147	
	Describe the structural features of enamel, including: (Hunter-Schreger bands, Incremental lines, Enamel lamellae, Enamel tufts, Enamel spindles, Gnarled enamel)	Ten Cate 9TH Edition Ch 7 Page 147-152	
	Discuss the effects of fluoride on enamel structure and resistance to caries.	Ten Cate 9TH Edition Ch 7 Page 154	
	Discuss the principles of enamel etching and its importance in restorative dentistry.	Ten Cate 9TH Edition Ch 7 Page 155	
	Describe the age changes & repair/regeneration of enamel	Ten Cate 9TH Edition Ch 7 Page 152 Ch 15 Page 324	
	Explain how developmental disturbances can affect enamel formation.	Ten Cate 9TH Edition Ch 7 Page 152	
Car1-OB-002	Describe the composition and structure of dentin	Ten Cate 9TH Edition Ch 8 Page 157 to 160	
	Describe the process of dentinogenesis, including the role of the molecular factors.	Ten Cate 9TH Edition Ch 8 Page 161 to 163	
	Differentiate between the three main types of dentin: primary, secondary, and tertiary, and describe their locations and formation.	Ten Cate 9TH Edition Ch 8 Page 160	
	Identify the structure of dentin radiographically	Ten Cate 9TH Edition Ch 8 Page 159.Fig 8.5	

	Describe the mechanisms that control dentin mineralization, and differentiate between the pattern of mineralization in mantle dentin and circumpulpal dentin.	Ten Cate 9TH Edition Ch 8 Page 164 to 165	
	Explain the processes of secondary and tertiary dentinogenesis, including the stimuli that trigger their formation.	Ten Cate 9TH Edition Ch 8 Page 165 to 167	
	Describe the structure and function of dentinal tubules.	Ten Cate 9TH Edition Ch 8 Page 167 to 170	
	Differentiate between peritubular and intertubular dentin, and explain their respective compositions and roles.	Ten Cate 9TH Edition Ch 8 Page 170 to 172	
	Explain the formation and significance of sclerotic dentin and interglobular dentin.	Ten Cate 9TH Edition Ch 8 Page 172 to 173	
	Describe the structural features of dentin, including incremental growth lines and granular layer of Tom's.	Ten Cate 9TH Edition Ch 8 Page 173 to 175	
	Describe the cellular contents of the dental pulp	Ten Cate 9TH Edition Ch 8 Page 175 to 183	
	Discuss the innervations, vascular supply & lymphatic supply of the dentin-pulp complex	Ten Cate 9TH Edition Ch 8 Page 183 to 186	
	Explain the mechanisms of dentin sensitivity, focusing on the hydrodynamic theory.	Ten Cate 9TH Edition Ch 8 Page 186 to 190	
	Describe the formation and clinical significance of pulp stones (denticles).	Ten Cate 9TH Edition Ch 8 Page190 to 191	

	Explain how developmental disturbances can affect Dentine formation (Denitnogenesis Imperfecta and dysplasias)	Berkovitz 4 th edition Page 338	
	Explain the age-related changes that occur in the dentin-pulp complex.	Ten Cate 9TH Edition Ch 8 Page191	
Car1-OB-003	List down the components of saliva. State the functions of saliva.	Ten Cate 9TH Edition Ch 11 Page 236 and 238	Saliva
Car1-OB-004	Differentiate between the following terms: Lobe, Axial Position, Contact Area, Interproximal space, Embrasure, Height of Contour, Cervical Line, Gingival Line, Epithelial Attachment.	Concise Dental Anatomy and morphology By Fuller ,5Th Edition unit 2 Page 24 to 26	Tooth Morphology
	Describe the number and names of the lobes of the anterior and posterior teeth		
	Describe and differentiate contact areas and height of contours including their location, size, function, age related changes, and clinical significance	Concise Dental Anatomy and morphology By Fuller ,5Th Edition unit 2 Page 30 TO 34	
	Describe the components, boundaries and functions of interproximal space and embrasures		
	Describe the depressions on tooth surface (pit, fissures, and developmental groves)		
	Understand the biological process of caries arrest and remineralization.	Berkovitz 4th edition page 121 and 128	
	Identify the factors that promote caries arrest.		

ORAL BIOLOGY			
CODE	SPECIFIC LEARNING OUTCOMES	TOTAL HOURS = 15	
		BOOK AND PAGE NO	TOPIC
Car1-OB-005	Draw and label "Enamel rods: fish scale pattern & keyhole pattern	Ten Cate 9TH Edition Ch 7 Fig 7.1 and 7.2	Enamel
	Ameloblasts (life cycle)	Ten Cate 9TH Edition Ch 7 Fig 7.14	
	DEJ with organic defects	Ten Cate 9TH Edition Ch 7 7.57,7.58,7.61 7.59	
	Draw and label Enamel rods, striae of retzius, bands of Hunter & Schreger, gnarled enamel, DEJ, tufts, lamella, spindles & neonatal lines.	Ten Cate 9TH Edition Ch 7 And Berkovitz fig 7.25 and 7.38 7.39	
	Identify amelogenesis imperfacta (hypoplastic, hypocalcified &hypomaturative types) & fluorosis.	Ten Cate 9TH Edition Ch 7 Fig 7.64 Page 152 -154 Berkovitz ch 22 fig 22.32	
	Identify enamel on x-rays.	Ten Cate 9TH Edition Ch 8 Fig 8.5B	
	Prepare the ground section of the tooth, mount it on a microscopic slide & identify the structural details of enamel & dentin		
Car1-OB-006	Draw & label primary, secondary & tertiary dentin, dentinal tubules in crown & root portions, dentin-pulp complex showing dentinal tubules, pre dentin & zones of dental pulp showing its different cells, odontoblast	Ten Cate 9TH Edition Ch 8 Fig 8.1 8.5 A,Fig 8.25,8.30 8.33 8.32 8.35	Dentin

	with different developmental shapes, peritubular and intra tubular dentin, inter globular dentin, dead tracts, pulp stones.	8.36	
	Identify dentin genesis imperfect, identify dentin & pulp cavity on x-rays.	Ten Cate 9TH Edition Ch 8 Fig 8.4	
Car1-OB-007	Identify and differentiate on tooth specimen/models/images: periodontium, lobe, axial position, contact point, contact area, interproximal space, embrasure, line angle, height of contour, cervical line, gingival line, and epithelial attachment.	On Study Models	Anatomic & Physiologic Considerations of Form & Function of Tooth
Car1-OB-008	Identify and differentiate on tooth specimen/models/images: pits, fissures, embrasures, and sulcus.	On Study Models	Introduction & Nomenclature of tooth

STUDT GUIDE 1ST YEAR
GENERAL PATHOLOGY

Sr.#	Day/Date	Topic	Facilitator	Reading Material
F-Pa-001		Define the terms: pathology, etiology & pathogenesis	Prof. dr. Shazia	Robbin's BASIC PATHOLOGY 10TH edition pg 31
F-Pa-002		Discuss causes of cell injury Describe the types and mechanism of cell injury Identify different types of cellular adaptations to stress with examples Discuss the mechanism of cellular adaptations to stress in detail	Prof. dr.Shazia Dr. Maimoona	Robbin's BASIC PATHOLOGY 10TH edition pg # 32-33 33 - 34/ 41-48 48 – 51
F-Pa-003		Identify the two types of cell death Enumerate the differences between them	Prof. dr Shazia	Robbin's BASIC PATHOLOGY 10TH edition pg # 34 – 40
F- Pa -004		Define necrosis Identify its various types with examples	Prof. dr. Shazia	Robbin's BASIC PATHOLOGY 10TH edition pg# 35 -37
F-Pa-005		Define apoptosis with examples Describe its mechanism and pathways in detail	Prof. dr. Shazia	Robbin's BASIC PATHOLOGY 10TH edition pg # 37 38 -40
F-Pa-006		Discuss mechanism & types of intracellular accumulations	Dr. Maimoona	Robbin's BASIC PATHOLOGY 10TH edition pg# 51 -52
F-Pa-007		Define pigmentation and identify various endogenous & exogenous pigments	Dr. Maimoona	Robbin's BASIC PATHOLOGY 10TH edition pg # 52-53
F-Pa-008		Define calcification and differentiate between dystrophic & metastatic calcification	Dr. Maimoona	Robbin's BASIC PATHOLOGY 10TH edition pg # 53 – 54
F- Pa -009		Explain the changes taking place due to aging at the cellular level	Oral Biology	Robbin's BASIC PATHOLOGY 10TH edition pg # 54 – 56

MICROBIOLOGY

Sr. #	Date/day	Topic	Facilitator Prof. Dr. Sadia / Dr. Sonia	Reference book Levinson's review of Medical Microbiology and Immunology 18th edition
F-Pa-010		Enlist microbes that cause infectious diseases along with important features. Differentiate between Eukaryotes & Prokaryotes.		Pg.# 1 Pg # 1-2
F-Pa-11		Discuss morphology, structure of bacteria including cell wall, cytoplasmic membrane, and cytoplasm of bacteria. Discuss important structures outside cell wall & bacterial spores.		Pg # 4-10 Pg# 10 – 11
		Differentiate between gram positive & negative bacterial cell wall on the basis of staining. Discuss bacterial growth curve.		Pg # 7 Pg# 14
		Define anaerobic & aerobic growth and discuss fermentation of sugars and iron metabolism. Define mutation and its different types and Define Recombination		Pg # 15 Pg # 17-20
		Discuss transfer of DNA within and between bacterial cells including conjugation, transduction, and transformation. Discuss classification of medically important bacteria.		Pg # 18-19 Pg # 22-23

		Define normal flora, colonizer, dysbiosis, and elaborate significance of normal flora. Discuss normal flora of different body sites including oral cavity, skin, respiratory tract, intestinal tract, etc.		Pg # 24 – 27 Pg# 25 – 26
		Define pathogen, pathogenesis, virulence factors, ID50, LD50. Discuss principles of pathogenesis.		Pg # 29 – 30 Pg # 30 – 42
		Enlist different types of bacterial infections and Describe stages of bacterial pathogenesis.		Pg # 43 -44
		Discuss determinants of bacterial pathogenesis that includes: • Transmission • Adherence to cell surfaces. • Invasion • Inflammation & intracellular survival • Toxin production • Immuno-pathogenesis		Pg # 30 – 42
		Enlist different strains of the same bacteria that can produce different diseases. Mechanisms of Antimicrobial Drugs		Pg # 43 Pg # 63 - 77
		Define typical stages of an infectious disease. Discuss role of biofilm and glycocalyx in causing infection.		Pg # 43 Pg# 34/10
		Tabulate the differences between sterilization and disinfection. Define sterilization and disinfection and describe the various methods of sterilization.		Pg # 93-96 Pg # 93-96

PRACTICAL WORK

F-Pa-013		Identify the types of necrosis on slides/ pictures		Cell Injury
F-Pa-014		Identify the cellular adaptation (atrophy, metaplasia, hyperplasia)		Cell Adaptations
F-Pa-015		Demonstrate the proper usage of hot air oven and autoclave		Microbiology Sterilization
F-Pa-016		Perform centrifugation and micro pipetting		Hematology Introduction to Lab Techniques

Study Guide of Oral Pathology

(1st year BDS)

Sr no.	Learning objectives	Facilitator	Reading materials
1.	Define Phenomenon of dental caries. Identify the etiological factors and explain their effects (pathogenesis) in the development of caries	Dr Rummana Aqeel	CAWSON'S ESSENTIALS OF ORAL PATHOLOGY AND ORAL MEDICINE . Chp 4 Page:53-70
2	Describe microbiological aspects of caries; the role and characteristic of cariogenic bacterias.	Dr Rummana Aqeel	CAWSON'S ESSENTIALS OF ORAL PATHOLOGY AND ORAL MEDICINE Chp 4 Page:53-70
3	Define Plaque and stages of Plaque development	Dr Rummana Aqeel	CAWSON'S ESSENTIALS OF ORAL PATHOLOGY AND ORAL MEDICINE Chp 4 Page:53-70
4	Describe the changes that develop in enamel and dentin of erupted teeth in association with microorganism	Dr Rummana Aqeel	CAWSON'S ESSENTIALS OF ORAL PATHOLOGY AND ORAL MEDICINE Chp 4 Page:53-70
5	Knows the etiology and pathogenesis of acquired and generalized enamel hypoplasia.	Prof Dr Sadia Iqbal	CONTEMPORARY ORAL AND MAXILLOFACIAL PATHOLOGY Chp 1 : Developmental Disturbances of the Oral Region Page:15-20

	Know the types of amelogenesis imperfecta according to their clinical and radiological appearance.		
6.	Identify and classify the developmental disturbances in structure of dentin. Describe and compare the clinical presentation, radiographic and histopathological features of dentinogenesis imperfecta and dentin dysplasia.	Prof Dr Sadia Iqbal	CONTEMPORARY ORAL AND MAXILLOFACIAL PATHOLOGY Chp 1: Developmental Disturbances of the Oral Region Page:20-27
7.	TEST	Prof Dr Sadia Iqbal Dr Rummana Aqeel Dr Alveena Nawaz	All topics covered in module
8.	Examine the histopathological changes of enamel and dentine associated with caries in E-Slides pictures.	Dr Alveena Nawaz	E slides Pictures. Oral Pathology Hand book.
9.	Identify bacteria in dental plague samples using Gram Staining under microscope.	Dr Alveena Nawaz	Practical demonstration and hands on activity on gram Staining procedure and its microscopic appearance.
10.	Identify Pathological processes in a carious	Dr Alveena Nawaz	Microscopic slides and Oral Pathology handbook

	ground section of tooth slide		
11.	TEST and OSPE	Prof Dr Sadia Iqbal, Dr Rummana Aqeel, Dr Alveena Nawaz	All topics covered in module.

Study Guide

COMMUNITY & PREVENTIVE DENTISTRY INTEGRATED CURRICULUM (2025)

COURSE OUTLINE

BLOCK 1

MODULE 1

FOUNDATION

&

MODULE 3

CARIOLOGY

Module 1 Foundation

Code	Specific Learning Outcomes	Topic	Recommended Book	Page Number	Hours = 5
F-CD-001	Define dental public health, health and its dimensions, disease, and illness.	Public Health	Fundamentals of Community & Preventive Dentistry *Nazli Gul Ghani, Shujaat H. Idris*	Page 2	
	Difference Between clinical and public health Dentist.		Fundamentals of Community & Preventive Dentistry *Nazli Gul Ghani, Shujaat H. Idris*	Page 3	
	Identify criteria for a disease to be of public health importance.		Fundamentals of Community & Preventive Dentistry *Nazli Gul Ghani, Shujaat H. Idris*	Page 8	
	Describe the Concepts of prevention and its levels.		Fundamentals of Community & Preventive Dentistry	Page 13	

Module 3 Cariology

Code	Specific Learning Outcomes	Topic	Recommended Book	Page Number	Hours = 8
Car1-CD-001	Discuss the importance and role of diet in caries.	Dental Caries	Fundamentals of Community & Preventive Dentistry *Nazli Gul Ghani, Shujaat H. Idris*	Page 122	
	Discuss the concept and importance of Stephen curve in dental caries		Fundamentals of Community & Preventive Dentistry *Nazli Gul Ghani, Shujaat H. Idris*	Page 131	
	Role of dental biofilm in acid production		Fundamentals of Community & Preventive Dentistry *Nazli Gul Ghani, Shujaat H. Idris*	Page 122	
	Discuss the concept of Demineralization and the remineralization process		Fundamentals of Community & Preventive Dentistry *Nazli Gul Ghani, Shujaat H. Idris*	Page 122	
	Describe the importance of oral hygiene and its effects on caries.		Fundamentals of Community & Preventive Dentistry *Nazli Gul Ghani, Shujaat H. Idris*	Page 122 & 134	
	Explain the		Fundamentals of	Page	

	concept of Keye's Circles in the etiology of dental caries		Community & Preventive Dentistry *Nazli Gul Ghani, Shujaat H. Idris*	124
Car1-CD-002	Classify Basic types of toothbrushing	Prevention of Dental Caries	• Textbook of Community & Preventive Dentistry *Hiremath* • Practical Log book	
	The clinical effect of tooth cleaning		• Textbook of Community & Preventive Dentistry *Hiremath* • *Practical Log Book*	
	The effect of dental flossing		• Textbook of Community & Preventive Dentistry *Hiremath* • *Practical Log Book*	
	Identify the basic concept and importance of fluoride in caries prevention		Fundamentals of Community & Preventive Dentistry *Nazli Gul Ghani, Shujaat H. Idris*	Page 114
	Discuss preventive measures, such as fluoride treatments, improved oral hygiene practices, and dietary modifications.		Fundamentals of Community & Preventive Dentistry *Nazli Gul Ghani, Shujaat H. Idris*	Page 114

Laboratory/Lab Work

Code	Specific Learning outcomes	Topic	Recommended Book	Page Number	Hours =1
Car1-OD-006	Identify fluoride gel and procedure to apply it	Prevention of Dental Caries	Fundamentals of Community & Preventive Dentistry *NazliGul Ghani, Shujaat H. Idris*	Page 114	

Log Book / Practical Book (Mandatory)

It is mandatory for each student to have log books with them and get it signed by their Supervisor and then countersigned by the Head of Department in your 2nd year course module.

RECOMMENDED TEXTBOOKS:

- Fundamentals of Community & Preventive Dentistry

  Nazli Gul Ghani, Shujaat H. Idris

REFERENCE BOOKS:

- Textbook of Community & Preventive Dentistry

  Hiremath

Prof. Dr. Nazli Shujaat

Head of Department

Community & Preventive Dentistry

STUDY GUIDE PHARMACOLOGY		
CODE	SPECIFIC LEARNING OUTCOMES	TOTAL HOURS = 20

		Reference Key	TOPIC
F-Ph-001	Students should be able to discuss General Concepts of Pharmacology	Lippincott 10th Edition Page: 1, 23	General Pharmacology
	Students should be able to define and describe Pharmacokinetics and Pharmacodynamics		
	Mechanisms of Drugs Transport/ Permeation	Lippincott 10th Edition Page: 6	
F-Ph-002	Sources of Drugs/ Active Principles	Lippincott 10th Edition Page: 5	Drugs Transport
	Enumerate advantages and disadvantages of various Routes of drug Administration		
	Define drug absorption & Bioavailability and factocs affecting	Lippincott 10th Edition Page: 4, 6, 7, 8, 9	
	Define and explain Distribution and Volume of Distribution	Lippincott 10th Edition Page: 9, 10, 11	
	Define and explain Redistribution and Plasma Protein Binding	Lippincott 10th Edition Page: 10	
	Explain the concept of Metabolism & Biotransformation	Lippincott 10th Edition Page: 12, 13, 14	
F-Ph-003	Define Enzyme Induction & Enzyme Inhibition	Lippincott 10th Edition Page: 14	Enzyme Induction & Enzyme Inhibition
	Describe the clinical significance of enzyme induction and enzyme inhibition with their examples		
	Define drug excretion	Lippincott 10th Edition Page: 15	
F-Ph-004	Enlist routes of drug excretion	Lippincott 10th Edition Page:15, 16	Drug excretion
	Describe processes of drug excretion through the kidneys	Lippincott 10th Edition Page: 15	

	Describe factors affecting glomerular filtration & tubular reabsorption	Lippincott 10th Edition Page: 15	
	Describe the Clinical Significance of Glomerular Filtration, Active Tubular Secretion and Passive Tubular Reabsorption of Drugs	Lippincott 10th Edition Page: 15	
	Define first pass elimination	Lippincott 10th Edition Page: 8	

F-Ph-005	Define and enlist factors affecting Plasma Half-Life	Lippincott 10th Edition Page: 11	Plasma Half-Life
	Explain clinical significance of plasma half-life		
	Explain steady state plasma concentration	Lippincott 10th Edition Page: 17, 18	
F-Ph-006	Define & Explain Elimination and Orders of Elimination – First & Zero Order Kinetics with examples	Lippincott 10th Edition Page: 12	Order Kinetics
	Tabulate differences between First order kinetics and Zero Order Kinetics		
F-Ph-007	Define, explain & calculate maintenance dose and loading dose using appropriate formula	Lippincott 10th Edition Page: 19	Maintenance dose
F-Ph-008	Understand the concept of drug clearance	Lippincott 10th Edition Page: 12 to 15	Drug clearance
	Describe factors affecting drug clearance		
	Explain the Clinical Significance of different values of Drug Clearance		
F-Ph-009	Elaborate Transmembrane signaling pathways	Lippincott 10th Edition Page: 23 to 27	Signaling pathways
	Name the Effectors controlled by G-proteins	Lippincott 10th Edition Page: 25	
F-Ph-010	Define Pharmacodynamics, Affinity, Effi Potency	Lippincott 10th Edition Page: 23, 27, 28, 29	Pharmacodynamics
	Explain Agonist, partial agonist, inverse agonist, bias, allosteric agonists and modulators with examples	Lippincott 10th Edition Page: 31, 32	

	Define Spare receptor and give clinical importance	Lippincott 10th Edition Page: 26, 27	
	Describe various Drug–antagonism types with examples	Lippincott 10th Edition Page: 32	
	Compare &Discuss the information derived from Graded and Quantal dose-response curves	Lippincott 10th Edition Page: 27, 28, 29, 33	
	Define Median Effective (ED50), Median Toxic (TD50) & Median Lethal Dose (LD50) and its clinical relevance	Lippincott 10th Edition Page: 33	
	Define Therapeutic index and give its clinical importance		
	Define Therapeutic window and give its clinical importance	Katzung & Trevor's 15th Edit Page: 30	
	Define Desensitization, Tachyphylaxis, Tolerance, Resistance, super sensitivity, hypersensitivity, super infection, iatrogenic effect, idiosyncrasy, and give examples	Katzung & Trevor's 15th Edit Page: 26, 189 Lippincott 10th Edition Page. 27	
	Describe the Phenomenon of down regulation and up regulation of receptors	Lippincott 10th Edition Page. 26, 27	
	Enlist factors affecting Dose and action of Drugs		
F-Ph-011	Describe Pharmacogenetics and give examples	Katzung & Trevor's 15th Edition Page: 41 to 44	Pharmacogenetics
F-Ph-012	Illustrate various phases of Drug development	Katzung & Trevor's 15th Edition Page: 9	Drug development
F-Ph-013	Describe Drug Interactions	Katzung & Trevor's 15th Edition Page: 512 to 515	Drug Interactions

PRACTICAL / LAB WORK			
PHARMACOLOGY			
CODE	SPECIFIC LEARNING OUTCOMES	TOTAL HOURS =02	
		Reference Key	TOPIC
F-Ph-014	Calculations of drug dosing (e.g., IV infusion) & dose of children.	Pharmacology & Pharmacy Practical Manual Moduler and Integrated Curriculum 2K23	Calculation
F-Ph-015	Calculations (Mean, Mode, Median, Standard Deviation, and Standard Error), and Metrology.		Drug dosing

Prof. Dr. Shazia Asim
In-Charge BDS Classes
Professor of Pharmacology Dept.
Lahore Medical & Dental College,
Lahore

Prof. Dr. Ajaz Fatima
Head of Pharmacology Department,
Lahore Medical & Dental College,
Lahore

STUDY GUIDE OPERATIVE DENTISTRY

COURSE DIRECTOR: PROF. DR. SAIMA RAZZAQ KHAN

S. NO	DAY/DATE FRIDAY(LECTURE)	DISCUSSION TOPIC	FACILITATOR	READING MATERIALS
1	30th MAY	PIT AND FISSURE CARIES	DR.AISHA	ART AND SCIENCE chapter 2
2	6TH JUNE	SMOOTH SURFACE CARIES	DR.AISHA	ART AND SCIENCE chapter 2
3	13 JUNE	ROOT CARIES	DR.AISHA	ART AND SCIENCE chapter 2
4	20 JUNE	ACTIVE CARIES	DR.AISHA	ART AND SCIENCE chapter 2
5	27th JUNE	ARRESTED CARIES	DR.AISHA	ART AND SCIENCE chapter 2

S. NO	DAY/DATE THURSDAY	HANDS ON EXERCISES/SMALL GROUP DISCUSSIONS DR.AISHA
1	5TH JUNE	Identify fluoride gel and procedure to apply it
2	12TH JUNE	How to use Disclosing agents for Identification of Dental Plaque on tooth surfaces
3	19TH JUNE	Identification on tooth models pits an fissure caries, smooth surface caries and root caries on E-Slides or clinical images.
4	26th JUNE	Identify the features of Arrested Caries and Active Caries on E-Slides or clinical images
5	3RD JULY	Identify the features of Arrested Caries and Active Caries on E-Slides or clinical images