



BDS INTEGRATED CURRICULUM

2k25 Version 2.0

**1st Year BDS
Session 25-26**

Block-2 Study Guide

Module 4	Module 5	Module 6	Module 7
Foundation-2	Craniofacial-2	Neurosciences-1	Alveo-Cemental Complex-1



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MISSION AND VISION OF UHS

Vision Statement:

UHS is a leading university aiming to keep its graduates apt with the ever-emerging global health challenges, evolving educational methodologies and emerging technological advancements to maintain its distinguishable position as a medical university.

Mission Statement:

UHS shall continue to strive for producing a human resource par at excellence to cater for the health needs of the people of Punjab and Pakistan.

MISSION AND VISION OF RCoD

Vision Statement:

To be a leading institution, producing globally competent health professionals through multidisciplinary integrated teaching to advance oral healthcare services and tackle local and global challenges with excellence in education, research, and innovation.

Mission Statement:

To train health professional students in an innovative educational environment, through revolutionary dental education, focusing on state-of-the-art clinical skills, patient care, national community health services, global research and technological advancements, to produce competent caregivers and life-long learners.

LIST OF ABBREVIATIONS	
Abbreviations	Subjects
UHS	University of Health Sciences
BDS	Bachelor of Dental Surgery
PRISME	Professionalism, Research, Informatics, Social Responsibility and Accountability, Management & Entrepreneurship, Ethics Evidence Based Dentistry
WHO	World Health Organization
A	Anatomy
AI	Artificial Intelligence
B	Biochemistry
Enr	Endocrinology
HR	Hepatorenal
GDC	General Dental Council
Ph	Pharmacology
P	Physiology
Pa	Pathology
PD	Prosthodontics
OB	Oral Biology
OP	Oral Pathology
CD	Community Dentistry
OD	Operative Dentistry
OM	Oral Medicine

ALC	Alveo-Cemental Complex
AMIA	American Medical Informatics Association
AMEE	Association of Medical Education in Europe
BhS	Behavioral Sciences
CNS	Central Nervous System
GIT	Gastrointestinal Tract
CVS	Cardiovascular System
TMJ	Temporomandibular Joint
CBC	Complete Blood Count
DR	Dental Radiology
DM	Dental Materials
ESR	Erythrocyte Sedimentation Rate
PCR	Polymerase Chain Reaction
ED50	Median Effective Dose
LD50	Median Lethal Dose
TD50	Median Toxic Dose
AUC	Area Under Curve
MCV	Mean Corpuscular Volume
MCH	Mean Corpuscular Hemoglobin
MCHC	Mean Corpuscular Hemoglobin Concentration
Na	Sodium
NS	Neurosciences
K	Potassium
DNA	Deoxyribonucleic Acid
TORCH	Toxoplasmosis, Other, Rubella, Cytomegalovirus, Herpes simplex



CF	Craniofacial
CFII	Craniofacial II
Car	Cariology
DEJ	Dentin enamel Junction
HERS	Hertwig's Epithelial Root Sheath
FDI	Fédération Dentaria Internationale
GAGs	Glycosaminoglycans
EFA	Essential Fatty Acids
Hb	Hemoglobin
HbA1c	Glycated Hemoglobin
ATP	Adenosine Triphosphate
RBC	Red Blood Cell
NMJ	Neuromuscular Junction
ID50	Median Infectious Dose
RCTs	Randomized Control Trials



CURRICULUM FRAMEWORK

BDS Integrated Curriculum 2k25

Version 2.0

Year-1 Modules

Block-1

1. Foundation-1
2. Craniofacial-1
3. Cariology-1

Block-2

4. Foundation-2
5. Craniofacial-2
6. Neurosciences-1
7. Alveo-Cemental Complex-1

Block-3

8. Blood & Cardiovascular system-1
9. Gastrointestinal Tract
10. Occlusion-1

PRISME Year 1

Professionalism, Research, Informatics (dental), Social Responsibility, Management/ Entrepreneurship & Evidence based Dentistry

CFRC Year 1

Clinical Foundation Rotation Clerkships

Islamiyat/Civis & Pakistan Studies

DEPARTMENT OF DENTAL EDUCATION

PRINCIPAL MESSAGE



At RCoD, our mission is to create a supportive and innovative learning environment where students can excel academically, professionally, and personally. Through rigorous academic programs, hands-on clinical experiences, and opportunities for cutting-edge research, we empower our students to become compassionate and skilled dental professionals ready to address the diverse needs of our global community.

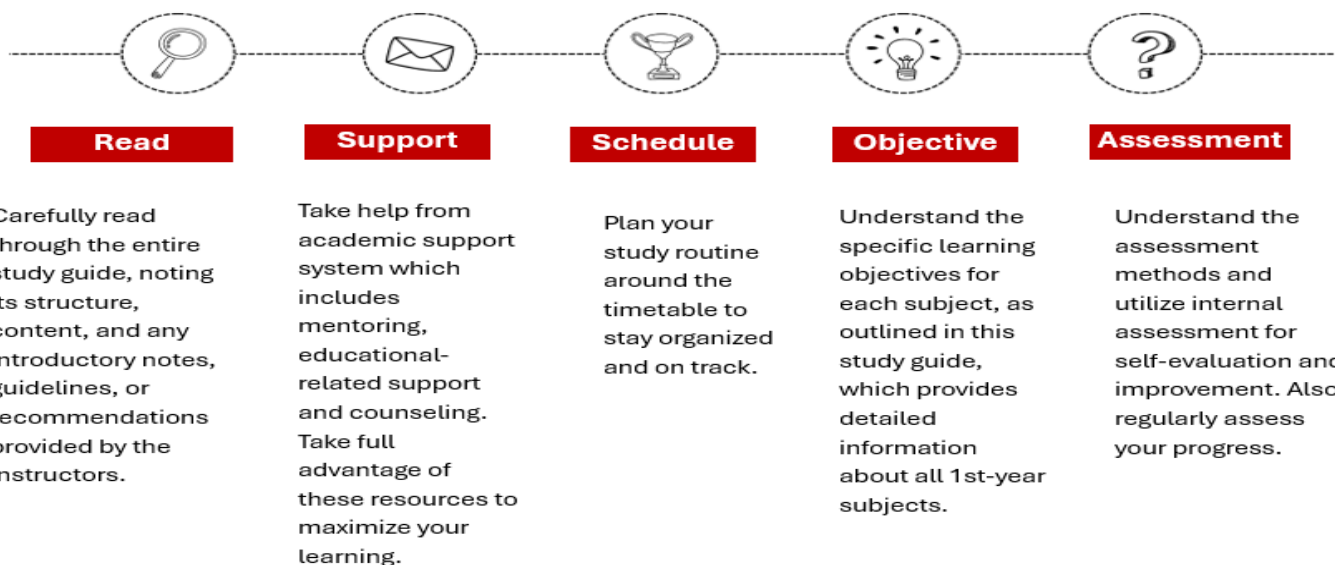
Beyond educating dental experts, we aim to nurture qualities of compassion, integrity, and a commitment to lifelong learning in our students.

Warm regards

Principal

Rahbar College of Dentistry

Prof. Dr. Muhammad Nasir Saleem



STUDY GUIDE DEVELOPMENT

This study guide has been thoughtfully developed by the **Department of Dental Education** to support students in their academic learning and examination preparation. Every effort has been made to ensure that the content is comprehensive, accurate, and aligned with the curriculum and learning outcomes. It is intended to serve as a valuable resource for students throughout the academic year.

Prepared by:

Department of Dental Education

Rahbar College of Dentistry

BLOOM'S TAXONOMY — KEY TO COLUMNS

Each Learning Outcome (LO) has been coded for its domain and level as follows:

COGNITIVE DOMAIN (C)		
Code	Level	Key Verbs / Descriptors
C1	Remember	Define, List, Enlist, Recall, Name, State
C2	Understand	Describe, Explain, Discuss, Classify, Differentiate, Compare, Summarize, Outline, Give
C3	Apply	Apply, Demonstrate, Calculate, Use, Solve, Perform, Draw, Relate, Trace, Develop
C4	Analyze	Analyze, Examine, Distinguish, Contrast, Correlate, Interpret, Tabulate, Identify (clinical)
C5	Evaluate	Evaluate, Assess, Justify, Critique, Appraise
C6	Create	Create, Design, Formulate, Construct, Elaborate

PSYCHOMOTOR DOMAIN (P) — Practical / Lab LOs only		
Code	Level	Key Verbs / Descriptors
P1	Observation	Observe / Perceive a skill
P2	Guided Response	Perform with guidance / imitation
P3	Mechanism / Precision	Perform accurately and independently
P4	Articulation	Coordinate multiple skills; adapt technique

AFFECTIVE DOMAIN (A)		
Code	Level	Key Verbs / Descriptors
A1	Receiving	Awareness; willingness to listen
A2	Responding	Participates; shows interest; answers
A3	Valuing	Committed to professional / ethical significance
A4	Organisation	Integrates multiple values; professional identity

Note: Psychomotor (–) indicates a Theory LO where no practical skill is directly assessed.



ACADEMIC SCHEDULE BLOCK-2

Block-2 Start Date	8 th June 2026
Block-2 Exam	28 th September – 2 nd October 2026
Block-2 Ends Date	2 nd October 2026

TIME TABLE

First Year BDS Block-2 Time Table									
Rahbar College of Dentistry, Lahore									
Day	8:00 - 8:50am	8:50-09:40am	09:40-10:30am	10:30am -11:20am	11:20am -12:10pm	Break 12:10-12:30pm	12:30 -1:20pm	1:20-2:10pm	2:10-3:00pm
Monday	Biochemistry Interactive Lecture	Anatomy Interactive Lecture	Physiology Interactive Lecture/Practical	Oral Biology Interactive Lecture	Oral Biology Practical	Break	Pharmacology Interactive lecture	GP/Microbiology Interactive Lecture	PRISME Interactive Lecture
Tuesday	Anatomy Interactive Lecture/Practical	Oral Biology Interactive Lecture	Oral Biology Interactive Lecture	Physiology Interactive Lecture	Research Interactive Lecture		GP/Microbiology Interactive Lecture	Biochemistry Interactive Lecture	Anatomy SGD
Wednesday	G. Pathology Interactive Lecture	Anatomy Interactive Lecture	Biochemistry Interactive Lecture	Oral Biology Interactive Lecture	Physiology Interactive Lecture		Oral Pathology/ Quran Practical/SGD	Periodontology/ Dental Radiology Interactive Lecture	Islamicat/ Pakistan studies Interactive lecture
Thursday	Oral Biology Interactive lecture	Oral Biology Practical	Physiology Interactive Lecture	Anatomy Interactive Lecture	G. Pathology Interactive Lecture				
Friday	8:00 - 8:50am Community Dentistry Interactive Lecture	8:50-09:40am Anatomy Interactive lecture	09:40-10:30am Biochemistry Interactive lecture	10:30am -11:20am Biochemistry Interactive Lecture/SGD	11:20am -12:10pm Physiology Interactive Lecture/SGD	12:10-1:00pm Physiology Interactive lecture	Break 1:00- 2:00pm Break	2:00-3:00pm Integrated Session	
All lectures will be held in Lecture hall 1									
On Wednesday Oral Pathology/ Quran slot Week 1 to 4 Oral pathology will be taught and Week 5 onwards Quran classes will be taught. Periodontology/ Dental Radiology slot: Week 1 to 6 Periodontology and in Week 6 to 12 Dental radiology will be taught.									

Block Coordinators/ Subject in Charges

Coordinators	
HOD Oral Biology/ Year Coordinator	Prof. Dr. Asad Mehmood
HOD Dental Education	Dr. Saima Norin
HOD Physiology/ Practical Exam Coordinator	Prof Dr. Saima Rizwan

Block-2 Subject In-charges	
HOD Operative Dentistry/ Principal	Prof. Dr. Muhammad Nasir Saleem
HOD Community Dentistry	Prof Dr. Fahad Mehtab Ud Din Dogar
HOD Anatomy	Prof. Dr. Attiya Mubarak
HOD Oral Biology	Prof. Dr. Asad Mehmood
HOD Physiology	Prof. Dr. Saima Rizwan
HOD Biochemistry	Prof. Dr. Afshan Zareen Bilal
HOD Pharmacology	Prof. Dr. Ahmad Alamgir
HOD Oral Pathology	Prof. Dr. M. Behzad Salahuddin
HOD General Pathology	Dr. Maria Noor (Focal Person)
HOD Dental Radiology	Dr. Ehsan Rathore
HOD Periodontology	Dr. Iftikhar Ahsen
HOD Islamiyat/ Quran/ Pak Studies	Mrs. Areeba Altaf
PRISME	
Domain Professionalism, Social Science Domain Research	Dr. Sadia Imran Cheema Prof Dr. Hina Zafar Raja
Domain Management & Entrepreneurship	Prof Dr. Fahad Mehtab
Domain Informatics	Talal Ahmad, Umer Bhatti



Module no. 4

FOUNDATION-2



MODULE RATIONALE

The Foundation II module builds upon the basic biomedical concepts introduced in Foundation I, emphasizing the integration of anatomy, physiology, biochemistry, and pathology with oral biology and dental relevance. It focuses on understanding blood composition and functions, the vascular and nervous systems, tissue responses to injury, and early disease mechanisms. The module introduces key principles of microbiology, pharmacology, and dental radiology to establish a bridge between foundational medical sciences and their clinical applications in dentistry. Through theory and practical components, students develop the ability to connect normal structure and function with pathological and clinical outcomes — forming a strong base for subsequent clinical modules.

MODULE OUTCOMES

- Describe the organization and functional components of the vascular and nervous systems.
- Explain the composition, formation, and functions of blood and its cellular elements, including mechanisms regulating erythropoiesis.
- Interpret biochemical pathways related to hemoglobin synthesis, porphyrin metabolism, and red blood cell energy production, along with their clinical correlations.
- Describe the structure, formation, and age-related changes in dentin and pulp, and relate these to dental pathologies.
- Explain the basic pharmacological principles governing drug absorption, distribution, metabolism, and excretion, with relevance to dental therapeutics.
- Identify common cellular adaptations, inflammatory processes, and mechanisms of wound healing under light microscopy.
- Describe the structure, classification, and growth of microorganisms; explain principles of sterilization, disinfection, and infection control in dental settings.
- Relate oral microbiology concepts, such as biofilm formation and pathogenic mechanisms, to dental infections and antibiotic resistance.
- Interpret conventional dental radiographs to recognize normal structures and common developmental anomalies.
- Demonstrate safe laboratory practices, basic microscopy, staining techniques, and correct calculation of drug dosages in practical settings.



SUBJECTS INTEGRATED IN THE MODULE
1. Biochemistry 2. Oral Biology & Tooth Morphology 3. Pharmacology & Therapeutics 4. General Pathology & Microbiology 5. Oral Pathology 6. Dental Radiology

THEORY

BIOCHEMISTRY							
CODE	SPECIFIC LEARNING OUTCOMES	TOPIC	Cognitive	Attitude	MIT	AT	Video Links
F2-B-001	Describe the structure of heme and briefly describe the steps of heme synthesis with its regulation. Explain the metabolism of iron, including its absorption, transport (transferrin), storage (ferritin, hemosiderin), and regulation. How does heme combine with globin to form hemoglobin and enlist the functions of hemoglobin. Enlist the types of hemoglobin along with their percentage and chain composition. Understand the oxygen-binding mechanism of hemoglobin, including the concepts of cooperative binding and allosteric regulation. Describe hemoglobin structure, functions, and oxygen dissociation curve. Include hemoglobinopathies (sickle cell anemia, thalassemia).	Structure, Synthesis & Functions of Hemoglobin	C2	A2	LGIS/SGD	MCQS	https://www.youtube.com/results?search_query=Ninja+Nerd+Oxygen+Hemoglobin+Dissociation+Curve https://www.youtube.com/results?search_query=Armando+Hasudungan+Iron+Metabolism+Heme+Synthesis

BIOCHEMISTRY							
CODE	SPECIFIC LEARNING OUTCOMES	TOPIC	Cognitive	Attitude	MIT	AT	Video Links
	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. Describe the oral and dental manifestations of porphyria, including erythrodontia, photosensitivity, mucosal lesions, and delayed healing.	Porphyria	C2	A3	LGIS/SGD	MCQS	https://www.youtube.com/watch?v=HOJhGFMHjsQ https://www.youtube.com/watch?v=thcuFwecltM https://youtu.be/72lwtFI9VE
F2-B-003	Describe RBC metabolism (glycolysis, pentose phosphate pathway, G6PD deficiency) and role of trace elements (iron, selenium). Explain RBC metabolism, including glycolysis, pentose phosphate pathway, and G6PD deficiency. Describe and outline the steps in hexose monophosphate pathway (HMP) and its significance in RBCs. Compare and contrast glycolysis and the HMP shunt.	Red Blood Cell Metabolism and Energy Pathways	C4	A2	LGIS/SGD	MCQS	https://youtu.be/gggC9vctvBQ https://youtu.be/eXXpUxg9vn4 https://youtu.be/8h98pqB_poo https://youtu.be/GPVxy5WutyA

BIOCHEMISTRY							
CODE	SPECIFIC LEARNING OUTCOMES	TOPIC	Cognitive	Attitude	MIT	AT	Video Links
	Explain hemolytic anemia due to pyruvate kinase and glucose-6-phosphate dehydrogenase deficiencies.						
F2-B-004	Describe vitamins (A, B6, B9, B12, E), their active forms, sources, RDA, biochemical roles, and deficiency manifestations.	Vitamins	C2	A2	LGIS/SGD	MCQS	https://www.youtube.com/watch?v=BvXVNCivtXQ https://www.youtube.com/watch?v=GEX0dLvZ1Mw https://www.youtube.com/watch?v=6PrWVgS5Sxk https://www.youtube.com/watch?v=KNwf9XTTr4A https://youtu.be/rEjldLx6JXg

ORAL BIOLOGY & TOOTH MORPHOLOGY							
COD E	SPECIFIC LEARNING OUTCOMES	TOPIC	Cognitive	Attitude	MIT	AT	Video Links
F2-OB001	Describe the composition and functions of dentin and pulp; correlate structural features with clinical conditions.	Pulp–Dentin Complex	C4	A3	LGIS/SGD	MCQS	https://youtu.be/RbcOpEe4Rw8 https://youtu.be/OvWxFwTNyoA
F2-OB002	Explain the structure, functions, and degradation of extracellular matrix in oral tissues.	Extracellular Matrix	C2	A2	LGIS/SGD	MCQS	https://youtu.be/cMNx17H3dRU
F2-OB003	Describe the process of dentinogenesis. Differentiate between the three main types of dentin: 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	Dentin	C4	A2	LGIS/SGD	MCQS	https://youtu.be/FTV1UErKg58 https://youtu.be/aT9cAQtlqnc https://youtu.be/Z2iIRjqAMXs https://youtu.be/nvsWZ_ZbPU https://youtu.be/di_Bgsrz-UE https://youtu.be/n2qdAFr0h9g

	that trigger their formation. Describe the structure and function of dentinal tubules. Differentiate between peritubular and intertubular dentin, and explain their respective compositions and roles. Explain the formation and significance of sclerotic dentin and interglobular dentin. Describe the structural features of dentin, including incremental growth lines and granular layer of Tom's.						
F2-OB004	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.	Pulp	C4	A3	LGIS/SGD	MCQS	https://youtu.be/pBuXmlxEWlc https://youtu.be/wjLULKd-IKA https://youtu.be/w4cJ6npwUrw https://youtu.be/fOH-QqmrCXg https://youtu.be/C2zgVX2cwh4 https://youtu.be/XYSZob01p5s

	Analyze the pulp's cellular response to dental caries and the mechanical trauma of cavity preparation.						
F2-OB005	Develop a detailed timeline chart illustrating the calcification stages and eruption periods for deciduous and permanent dentition.	Developmental Timeline and Chronology of Dentition	C6	A2	LGIS/SGD	MCQS	https://youtu.be/Nz4HQvkJ65w
F2-OB006	Describe the anatomy of the pulp tissue and pulp cavities in teeth.	Pulp Anatomy	C2	A2	LGIS/SGD	MCQS	https://youtu.be/v7Q3u9ynZug
	Explain the age-related morphological and physiological changes occurring in the pulp cavity.	Age-Related Changes in the Pulp	C2	A2	LGIS/SGD	MCQS	https://www.youtube.com/results?search_query=Dental+Pulp+Structure+Functions+Age+Changes

CODE	SPECIFIC LEARNING OUTCOMES	TOPIC	Cognitive	Attitude	MIT	AT	Video Links
F2-Ph001	Describe drug absorption and factors affecting it. Describe drug distribution, including concepts of volume of distribution and plasma protein binding.	Drug Transport	C2	A2	LGIS/SGD	MCQS	https://youtu.be/kkUxUBoM-hM https://youtu.be/gD9LiXpq0Tk
F2-Ph002	Describe drug metabolism (biotransformation, first-pass metabolism, phase I and II reactions, enzyme induction & inhibition, clinical relevance).	Drug Metabolism	C2	A2	LGIS/SGD	MCQS	https://youtu.be/tC3vqoiVLDE
F2-Ph003	Describe drug excretion, elimination, and clearance mechanisms (renal, biliary, other routes) and factors affecting them.	Drug Excretion	C2	A2	LGIS/SGD	MCQS	https://youtu.be/k04PQIAFjBY
F2-Ph004	Define half-life, loading dose, maintenance dose, and steady-state concentration; explain their clinical relevance.	Plasma Half-Life	C2	A3	LGIS/SGD	MCQS	https://youtu.be/mBDMS1kHhcg
F2-Ph005	Define pharmacodynamics: dose-response relationships,	Pharmacodynamics	C3	A2	LGIS/SGD	MCQS	https://youtu.be/5vZ7RuBU6DM

	graded vs quantal response. Draw dose response curves.						
F2- Ph006	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. Explain agonist & antagonists with its types. Differentiate between agonists, antagonists, and partial agonists with examples. Define therapeutic index and explain its clinical significance. Define Median Effective (ED50), Median Toxic (TD50) & Median Lethal Dose (LD50) and its clinical relevance. Illustrate various phases of drug development. Describe drug interactions. Identify factors that alter drug response (age, genetics, disease, pregnancy). Describe adverse drug reactions and their classification.	Receptors, Drug Development & Interactions	C4	A3	LGIS/SGD	MCQS	https://youtu.be/RMV130vU8gA

	Define Desensitization, Tachyphylaxis, Tolerance, Resistance, super-sensitivity, hypersensitivity, and give examples.						
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GENERAL PATHOLOGY							
CODE	SPECIFIC LEARNING OUTCOMES	TOPIC	Cognitive	Attitude	MI T	AT	Video Links
F2- Pa001	Describe intracellular accumulations (lipids, proteins, glycogen, pigments). Define calcification; differentiate between dystrophic and metastatic calcification.	Intracellular Accumulations and Calcification	C2	A2	LGIS /SGD	MCQS	https://youtu.be/TjOyl2cUNXM
F2- Pa002	Define pigmentation; describe endogenous (melanin, hemosiderin) and exogenous pigments (carbon, tattoos). Define amyloidosis; describe pathogenesis and morphology.	Pigmentation and Amyloidosis	C2	A2	LGIS /SGD	MCQS	https://youtu.be/1ajSt98a0Yk https://youtu.be/wkd8YsaTIWI
F2- Pa003	Define and explain cellular adaptations: atrophy, hypertrophy, hyperplasia,	Cellular Adaptations	C2	A2	LGIS /SGD	MCQS	https://youtu.be/L1V98A2zNNY

GENERAL PATHOLOGY							
CODE	SPECIFIC LEARNING OUTCOMES	TOPIC	Cognitive	Attitude	MI T	AT	Video Links
	metaplasia, dysplasia.						
F2- Pa004	Define aging; describe theories of aging and morphological features.	Aging	C2	A2	LGIS /SGD	MCQS	https://www.youtube.com/results?search_query=NPTEL+Introduction+to+Aging
F2- Pa005	Define acute and chronic inflammation and enlist cardinal signs. Enumerate the differences between acute and chronic inflammation.	Inflammation	C4	A2	LGIS /SGD	MCQS	https://youtu.be/NUG5n61v2Dw
F2- Pa006	Define wound healing (primary vs secondary intention).	Wound Healing	C2	A2	LGIS /SGD	MCQS	https://youtu.be/Q3cVCiraAgw

MICROBIOLOGY							
CODE	SPECIFIC LEARNING OUTCOMES	TOPIC	Cognitive	Attitude	MI T	AT	Video Links
F2- Pa007	Define microbes and describe their role in health and disease. Differentiate between prokaryotic and eukaryotic microorganisms.	Introduction to Microbiology	C4	A2	LGIS /SGD	MCQS	https://youtu.be/Pxujitlv8wc

MICROBIOLOGY							
CODE	SPECIFIC LEARNING OUTCOMES	TOPIC	Cognitive	Attitude	MI T	AT	Video Links
	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.						
F2-Pa008	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.	Microbial Physiology and Genetics	C4	A2	LGIS /SGD	MCQS	https://youtu.be/7Lh-M-rX86Q

MICROBIOLOGY							
CODE	SPECIFIC LEARNING OUTCOMES	TOPIC	Cognitive	Attitude	MI T	AT	Video Links
F2-Pa009	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.	Infection Control in Dentistry	C3	A3	LGIS /SGD	MCQS	https://www.youtube.com/watch?v=jSW62-qMBBM https://www.youtube.com/watch?v=eAbJA768Rsg
F2-Pa010	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 opportunistic infections.	Normal Flora and Host Interaction	C2	A2	LGIS /SGD	MCQS	https://www.youtube.com/watch?v=EFCC_vNFM3M
F2-Pa011	Define pathogen, pathogenesis, virulence factors, ID ₅₀ , and LD ₅₀ . 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,	Bacterial Pathogenesis and Virulence	C4	A3	LGIS /SGD	MCQS	https://youtu.be/C6U1zZgq9Ws

MICROBIOLOGY							
CODE	SPECIFIC LEARNING OUTCOMES	TOPIC	Cognitive	Attitude	MI T	AT	Video Links
	inflammation, toxin production. 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.						
F2- Pa012	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.	Antibiotic Agents	C3	A3	LGIS /SGD	MCQS	https://youtu.be/NGwP471sehl
F2- Pa013	Define osteomyelitis and list microorganisms commonly associated with it. Discuss Actinomycetes with emphasis on epidemiology, virulence factors, and pathogenesis in cervicofacial infections.	Oral Microbiology and Related Infections	C2	A2	LGIS /SGD	MCQS	https://www.youtube.com/watch?v=l9yGc73lrss

MICROBIOLOGY							
CODE	SPECIFIC LEARNING OUTCOMES	TOPIC	Cognitive	Attitude	MI T	AT	Video Links
F2-Pa014	Describe the structure and classification of viruses (DNA and RNA). Explain basic principles of viral replication and its clinical relevance in oral infections.	Introduction to Virology	C2	A2	LGIS /SGD	MCQS	https://youtu.be/Axj4PJFoGjA https://youtu.be/-DGkZ2AM7RU
F2-Pa015	Describe the structure and classify fungi.	Mycology	C2	A2	LGIS /SGD	MCQS	https://youtu.be/glEm3QV58Dw

ORAL PATHOLOGY							
CODE	SPECIFIC LEARNING OUTCOMES	TOPIC	Cognitive	Attitude	MI T	AT	Video Links
F2-OP001	Describe developmental disturbances in dentin. Explain dentinogenesis imperfecta, regional odontodysplasia and dentin dysplasia (clinical, radiographic, histopathological).	Dentinogenesis Imperfecta	C4	A2	LGIS /SGD	MCQS	https://www.youtube.com/results?search_query=Easy+Dentistry+developmental+disturbances+of+dentin
F2-OP002	Describe dentinal caries.	Dentinal Caries	C2	A2	LGIS /SGD	MCQS	https://youtu.be/hxApCqJQow

DENTAL RADIOLOGY							
CODE	SPECIFIC LEARNING OUTCOMES	TOPIC	Cognitive	Attitude	MIT	AT	Video Links
F2-DR001	Describe the basic principles of dental imaging and its role in diagnosis. Identify the types and indications of conventional radiographs, including periapical, bitewing, and orthopantomogram (OPG).	Introduction to Dental Radiology	C2	A2	LGIS/SGD	MCQS	https://youtu.be/CCqmUuJeQ0c

PRACTICALS / LAB WORK

ORAL BIOLOGY — PRACTICAL							
CODE	SPECIFIC LEARNING OUTCOMES	TOPIC	Cognitive	Psychomotor	Attitude	MIT	AT
F2-OB008	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	C3	P3	A3	Demonstration	OSPE/OSVE

PHARMACOLOGY — PRACTICAL							
CODE	SPECIFIC LEARNING OUTCOMES	TOPIC	Cognitive	Psychomotor	Attitude	MIT	AT
F2-Ph007	Calculate drug dose & rate of infusion and unit conversions (Posology). Apply dose calculation principles in labs.	Dose Calculation	C3	P3	A3	Demonstration	OSPE/OSVE

PATHOLOGY — PRACTICAL							
CODE	SPECIFIC LEARNING OUTCOMES	TOPIC	Cognitive	Psychomotor	Attitude	MIT	AT
F2-Pa016	Identify cellular adaptations (metaplasia) in pictures.	Microscopic Identification	C4	P2	A2	Demonstration	OSPE/OSVE

ORAL PATHOLOGY — PRACTICAL							
CODE	SPECIFIC LEARNING OUTCOMES	TOPIC	Cognitive	Psychomotor	Attitude	MIT	AT
F2-OP003	Identify dentinogenesis imperfecta, pulp cavity, and dentin on radiographs.	Dentinogenesis Imperfecta	C4	P2	A2	Demonstration	OSPE/OSVE

MICROBIOLOGY — PRACTICAL							
CODE	SPECIFIC LEARNING OUTCOMES	TOPIC	Cognitive	Psychomotor	Attitude	MIT	AT
F2-Pa017	Perform Gram staining on bacterial smears and identify Gram-positive and Gram-negative bacteria & ZN for MTB under the microscope.	Microscopic Identification	C3	P3	A3	Demonstration	OSPE/OSVE
F2-Pa018	Demonstrate appropriate disinfection methods for dental instruments and materials.	Disinfection	C3	P2	A3	Demonstration	OSPE/OSVE
F2-Pa019	Demonstrate appropriate sterilization methods (autoclave, dry heat, & moist heat) for dental instruments.	Sterilization	C3	P2	A3	Demonstration	OSPE/OSVE
F2-Pa020	Identify culture media used in Microbiology laboratory for identification of pathogens (blood agar, chocolate agar, McConkey agar, Nutrient agar, SDA, LJ medium, TSI, Citrate, Urease).	Culture Media	C2	P2	A2	Demonstration	OSPE/OSVE

DENTAL RADIOLOGY — PRACTICAL							
CODE	SPECIFIC LEARNING OUTCOMES	TOPIC	Cognitive	Psychomotor	Attitude	MIT	AT
F2-DR002	Interpret basic dental radiographs to recognize normal anatomy and general radiological appearances of common pathology (radiolucency, radiopacity, and resorption).	Interpretation of Conventional Radiographs	C4	P2	A3	Demonstration	OSPE/OSVE



Module no. 5

CRANIOFACIAL - 2



DEPARTMENT OF DENTAL EDUCATION

CRANIOFACIAL-2

MODULE RATIONALE

Craniofacial II builds on foundational anatomical and physiological concepts introduced earlier, emphasizing the structure and function of the head and neck in relation to dental practice. The module integrates gross anatomy, physiology, biochemistry, and oral biology to provide students with a detailed understanding of cranial nerves, facial muscles, vascular supply, and sensory organs relevant to dentistry. Students also explore the physiology of nerve conduction and muscle contraction, as well as the biochemical and microscopic basis of muscle and bone integrity. Through dissections, laboratory work, and microscopic analysis, the module strengthens students' understanding of normal structure and function — laying the groundwork for clinical application, anesthesia, oral surgery, and pathology in later years.

MODULE OUTCOMES

- Describe the anatomy of the scalp, face, orbit, temporal, infratemporal, and pterygopalatine fossae, including their neurovascular and lymphatic components.
- Explain the anatomical basis and clinical significance of facial infections, scalp injuries, and fractures of the facial skeleton.
- Identify the muscles of facial expression, extraocular muscles, and muscles of mastication with their attachments, nerve supply, and actions.
- Describe the course, branches, and clinical implications of major cranial nerves, particularly the facial, trigeminal, oculomotor, trochlear, and abducent nerves.
- Explain the structure, vascular supply, and innervation of the ear, nose, paranasal sinuses, and their relevance in dental and ENT pathologies.
- Discuss the physiology of nerve impulse generation, conduction, and synaptic transmission, and relate these concepts to the mechanism of local anesthesia.
- Explain skeletal muscle structure and contraction, including the roles of sarcomere components, motor units, and energy systems in muscle physiology.
- Correlate biochemical pathways of energy production with muscle performance and fatigue, emphasizing ATP generation and glycogen metabolism.

- Describe the structure, composition, and function of collagen, elastin, and extracellular matrix in maintaining musculoskeletal integrity.
- Identify the microscopic structure of bone and explain the functions of osteoblasts, osteocytes, and osteoclasts in bone formation and remodeling.
- Demonstrate identification of major neurovascular structures and muscles in the head and neck on models or cadaveric specimens.
- Analyze histological slides of bone and muscle tissues, correlating microscopic features with physiological and biochemical functions.

SUBJECTS INTEGRATED IN THE MODULE

1. Physiology
2. Anatomy
3. Biochemistry
4. Oral Biology & Tooth Morphology
5. General Pathology & Microbiology

THEORY

GROSS ANATOMY

CODE	SPECIFIC LEARNING OUTCOMES	TOPIC	Cognitive	Attitude	MIT	AT	Video Links
CF2-A001	List the layers of the scalp and describe	Scalp	C2	A3	LGIS/SGD	MCQS	https://youtu.be/BAreydhBK5s

GROSS ANATOMY							
CODE	SPECIFIC LEARNING OUTCOMES	TOPIC	Cognitive	Attitude	MIT	AT	Video Links
	their anatomical features, including neurovascular supply and lymphatic drainage. 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-A002	Enlist in tabulated manner the muscles of facial expression, giving their nerve supply and actions. 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.	Face	C4	A3	LGIS/SGD	MCQS	https://youtu.be/Qh_T5QVVFwE

GROSS ANATOMY							
CODE	SPECIFIC LEARNING OUTCOMES	TOPIC	Cognitive	Attitude	MIT	AT	Video Links
	Define the routes of spread of infection from face to brain.						
CF2-A003	Define the boundaries and openings of orbital cavity. 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. Give the clinical correlates of nerves supplying the	Eye	C2	A2	LGIS/SGD	MCQS	https://youtu.be/7lBtIGvS1Gc

GROSS ANATOMY							
CODE	SPECIFIC LEARNING OUTCOMES	TOPIC	Cognitive	Attitude	MIT	AT	Video Links
	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.						
CF2-A004	Describe the boundaries, contents and primary communications of temporal, infratemporal and pterygopalatine fossa. Describe the location, roots and distribution of pterygopalatine ganglion.	Temporal, Infratemporal and Pterygopalatine Fossa	C2	A3	LGIS/SGD	MCQS	https://youtu.be/9taW-Th3ycc
CF2-A005	Describe the anatomical features and neurovascular supply of external ear. Describe the boundaries, contents, neurovascular supply and	Ear	C2	A2	LGIS/SGD	MCQS	https://youtu.be/unDpXRE_PPA

GROSS ANATOMY							
CODE	SPECIFIC LEARNING OUTCOMES	TOPIC	Cognitive	Attitude	MIT	AT	Video Links
	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-A006	Describe the anatomical features and neurovascular supply of external nose. 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.	Nose	C2	A3	LGIS/SGD	MCQS	https://youtu.be/e3gsndH9q1s
CF2-A007	Identify the paranasal sinuses (maxillary, frontal, ethmoidal, sphenoidal) and describe their	Sinuses	C4	A3	LGIS/SGD	MCQS	https://youtu.be/iwwFPQk7SJU

GROSS ANATOMY							
CODE	SPECIFIC LEARNING OUTCOMES	TOPIC	Cognitive	Attitude	MIT	AT	Video Links
	location, neurovascular supply, relations, and drainage pathways. 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-A008	Classify fractures of the maxilla based on anatomical patterns (Le Fort classification). Classify fractures of the mandible based on anatomical regions.	Fractures	C4	A3	LGIS/SGD	MCQS	https://youtu.be/AIHjeQwWpgw https://youtu.be/OxtBYmfoqak

PHYSIOLOGY							
COD E	SPECIFIC LEARNING OUTCOMES	TOPIC	Cognitive	Attitude	MI T	AT	Video Links
CF2-P001	Describe the physiological anatomy of a neuron, including its structure and function.	Membrane Potentials and Action Potentials (Nerve)	C2	A2	LGIS /SGD	MCQS	https://www.youtube.com/watch?v=tlzF2tWy6KI
CF2-P002	Enlist the neuroglia cells responsible for myelination in CNS & PNS. Enlist the steps of myelination in peripheral nervous system. Define Multiple sclerosis.	Myelinated and Unmyelinated Nerve Fibers	C2	A2	LGIS /SGD	MCQS	https://www.youtube.com/watch?v=vcT3kmW1BoY
CF2-P003	Explain Nernst potential of Na & K. Derive the Nernst equation. Explain the physiological basis of the Goldman equation and write the equation.	Membrane Potentials	C3	A2	LGIS /SGD	MCQS	https://youtu.be/S_Cyh6QNY_0
CF2-P004	Describe the resting membrane potential of a nerve fiber and the role of various ion channels. Discuss role of different channels in calculating resting membrane potential of a nerve fiber.	Resting Membrane Potential	C2	A2	LGIS /SGD	MCQS	https://youtu.be/hk09AkV5_Kc
CF2-P005	Define action potential and ionic basis.	Action Potentials	C4	A3	LGIS /SGD	MCQS	https://www.youtube.com/watch?v=XnksofQN8_s

PHYSIOLOGY							
COD E	SPECIFIC LEARNING OUTCOMES	TOPIC	Cognitive	Attitude	MI T	AT	Video Links
	Discuss the role of voltage-gated channels in generating action potentials. Define threshold stimulus. Define the All-or-None Law. Define absolute refractory period and relative refractory period and mention their physiological basis. Discuss the effects of hypocalcemia on nerve excitability. Explain the mechanism of local anesthetics on nerve excitability.						
CF2-P006	Explain the propagation of action potentials. Define saltatory conduction and its benefits. Explain mechanism of tetany.	Propagation of the Action Potential	C2	A2	LGIS /SGD	MCQS	https://youtu.be/w-waXZ2LDRE
CF2-P007	Describe the physiological anatomy of skeletal muscles. Describe the structure of Sarcomere.	Contraction of Skeletal Muscle	C2	A2	LGIS /SGD	MCQS	https://youtu.be/bjyM13pe9NA
CF2-P008	Explain general mechanism of	General Mechanism of	C2	A2	LGIS /SGD	MCQS	https://youtu.be/bjyM13pe9NA

PHYSIOLOGY							
COD E	SPECIFIC LEARNING OUTCOMES	TOPIC	Cognitive	Attitude	MI T	AT	Video Links
	skeletal muscle contraction (walk along theory).	Muscle Contraction					
CF2-P009	Define and differentiate isotonic and isometric contraction with 2 examples of each. Give physiological basis of tetanization and multiple fiber summation. Define a 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.	Characteristics of Whole Muscle Contraction	C4	A2	LGIS /SGD	MCQS	https://youtu.be/8UzdS-9hD4w
CF2-P010	Describe physiology of muscle contraction, including sliding filament theory, excitation–contraction coupling, neuromuscular junction, endplate potential, and muscle fatigue. Describe the types of smooth muscle and explain their functional properties,	Smooth Muscles	C2	A2	LGIS /SGD	MCQS	https://youtu.be/qEVRoKuo4U

PHYSIOLOGY							
COD E	SPECIFIC LEARNING OUTCOMES	TOPIC	Cognitive	Attitude	MI T	AT	Video Links
	including the latch phenomenon.						

BIOCHEMISTRY							
CODE	SPECIFIC LEARNING OUTCOMES	TOPIC	Cognitive	Attitude	MI T	AT	Video Links
CF2-B001	Describe the structure, types, biosynthesis, and functions of collagen and elastin, and explain their roles in maintaining mechanical strength and elasticity of muscle connective tissue. Identify disorders associated with collagen and elastin defects, particularly those affecting muscle support structures and connective tissue integrity. Explain the composition and function of the extracellular matrix (ECM) in muscle tissue, including the roles of proteoglycans, collagen, fibronectin, and integrins.	Biochemistry and Structural Basis of Muscle Function and Integrity	C4	A2	LGIS /SGD	MCQS	https://www.youtube.com/watch?v=OoYXQYOC9AQ https://www.youtube.com/watch?v=iq6sAUPQ4yE https://www.youtube.com/watch?v=cNg6w7lpR1E https://www.youtube.com/watch?v=UM8i1Lfoc6U https://www.youtube.com/watch?v=-dbRterutHY https://www.youtube.com/watch?v=FQFBygnIONU

BIOCHEMISTRY							
CODE	SPECIFIC LEARNING OUTCOMES	TOPIC	Cognitive	Attitude	MI T	AT	Video Links
CF2-B002	Explain the structure and basic function of the electron transport chain (ETC) and describe how oxidative phosphorylation generates ATP in muscle cells. Explain the processes of glycogenesis and glycogenolysis in muscle tissue, including their regulation, the role of key enzymes, and their contribution to ATP production during exercise. Discuss the role of muscle glycogen as an energy source during different exercise intensities, its depletion and recovery. Describe the ATP–phosphocreatine (ATP-PC) system and its role in providing immediate energy during short-term, high-intensity muscle activity. Differentiate muscle fiber types (Type I, IIa, IIb) based on structure, metabolism, and functional properties.	Energy Production in Muscles	C4	A2	LGIS /SGD	MCQS	https://www.youtube.com/watch?v=LsRQ5_EmxJA https://www.youtube.com/watch?v=vc21ccXf5vY https://www.youtube.com/watch?v=nt2H3k6mC68 https://www.youtube.com/watch?v=3jqxLodarME https://www.youtube.com/watch?v=YQV_ODVCzQQ https://www.youtube.com/watch?v=mcAQWW-kuS4 https://www.youtube.com/watch?v=agT9atQdHoc
CF2-B003	Describe vitamin C and its active forms, sources, RDA, biochemical roles, and deficiency manifestations.	Vitamins	C2	A2	LGIS /SGD	MCQS	https://www.youtube.com/watch?v=3H_5jqTMB8o

ORAL BIOLOGY & TOOTH MORPHOLOGY							
CODE	SPECIFIC LEARNING OUTCOMES	TOPIC	Cognitive	Attitude	MIT	AT	Video Links
CF2-OB001	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 regulation of bone cell formation.	Bone	C4	A2	LGIS/SGD	MCQS	https://youtu.be/Ei4seya3dOg https://youtu.be/Vd0mBXPsITM

MICROBIOLOGY							
COD E	SPECIFIC LEARNING OUTCOMES	TOPIC	Cognitive	Attitude	MIT	AT	Video Links
CF2-Pa001	Define microbial teratogens, Define TORCH infections and identify the impact of maternal infections (TORCH complex) on	Microbial Teratogens	C4	A2	LGIS/SGD	MCQS	https://www.youtube.com/watch?v=X-oHb0CW7XM

MICROBIOLOGY							
COD E	SPECIFIC LEARNING OUTCOMES	TOPIC	Cognitive	Attitude	MIT	AT	Video Links
	embryonic development and their dental implications.						
CF2-Pa002	Describe the epidemiology, transmission, virulence factors, pathogenesis, laboratory diagnosis, and prevention of Staphylococci.	Staphylococci	C2	A2	LGIS/SG D	MCQ S	https://www.youtube.com/watch?v=ZxIP_dMPRXc
CF2-Pa003	Describe the epidemiology, transmission, virulence factors, pathogenesis, laboratory diagnosis, and prevention of Mucormycosis .	Mucormycosis	C2	A2	LGIS/SG D	MCQ S	https://www.youtube.com/watch?v=34TcHEzz0XE
CF2-Pa004	Describe the epidemiology, transmission, virulence factors, pathogenesis, laboratory diagnosis, and prevention of Streptococci.	Streptococci	C2	A2	LGIS/SG D	MCQ S	https://www.youtube.com/watch?v=2CcYkuTFUkg
CF2-Pa005	Describe the epidemiology,	Actinomyces	C2	A2	LGIS/SG D	MCQ S	https://www.youtube.com/watch?v=gH2H_uhHGrY

MICROBIOLOGY							
COD E	SPECIFIC LEARNING OUTCOMES	TOPIC	Cognitive	Attitude	MIT	AT	Video Links
	transmission, virulence factors, pathogenesis, laboratory diagnosis, and prevention of Actinomyces.						
CF2-Pa006	Describe the epidemiology, transmission, virulence factors, pathogenesis, laboratory diagnosis, and prevention of Corynebacterium diphtheriae.	Corynebacterium diphtheriae	C2	A2	LGIS/SG D	MCQ S	https://www.youtube.com/watch?v=2Nskyh58xZU https://www.youtube.com/watch?v=7z7CnXY3xrM
CF2-Pa007	Describe the epidemiology, transmission, virulence factors, pathogenesis, laboratory diagnosis, and prevention of Porphyromonas.	Porphyromonas	C2	A2	LGIS/SG D	MCQ S	https://www.youtube.com/watch?v=i8ASjBrLv84
CF2-Pa008	Describe the epidemiology, transmission, virulence factors, pathogenesis, laboratory diagnosis, and	Fusobacterium	C2	A2	LGIS/SG D	MCQ S	https://www.youtube.com/watch?v=Uix1o_FGczQ

MICROBIOLOGY							
COD E	SPECIFIC LEARNING OUTCOMES	TOPIC	Cognitive	Attitude	MIT	AT	Video Links
	prevention of Fusobacterium.						
CF2-Pa009	Describe the epidemiology, transmission, virulence factors, pathogenesis, laboratory diagnosis, and prevention of Candida.	Candida	C2	A2	LGIS/SGD	MCQS	https://www.youtube.com/watch?v=7aWm4kYLpwU

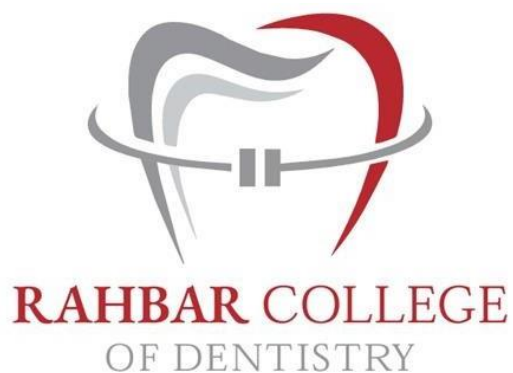
PRACTICALS / LAB WORK

GROSS ANATOMY — PRACTICAL							
CODE	SPECIFIC LEARNING OUTCOMES	TOPIC	Cognitive	Psychomotor	Attitude	MIT	AT
CF2-A009	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	C3	P3	A3	Demonstration	OSPE/OSVE

GROSS ANATOMY — PRACTICAL							
CODE	SPECIFIC LEARNING OUTCOMES	TOPIC	Cognitive	Psychomotor	Attitude	MIT	AT
CF2-A010	Identify and demonstrate the origin, insertion, nerve supply, and actions of the muscles of facial expression on models or cadaveric specimens.	Jaw Muscles	C3	P3	A3	Demonstration	OSPE/OSVE
CF2-A011	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	C3	P3	A3	Demonstration	OSPE/OSVE

ORAL BIOLOGY — PRACTICAL							
CODE	SPECIFIC LEARNING OUTCOMES	TOPIC	Cognitive	Psychomotor	Attitude	MIT	AT
CF2-OB002	Draw and label osteoblasts, osteocytes, and osteoclasts and correlate each with its function.	Bone	C3	P3	A2	Demonstration	OSPE/OSVE
CF2-OB003	Draw and label the stages / histological features of	Ossification	C3	P3	A2	Demonstration	OSPE/OSVE

ORAL BIOLOGY — PRACTICAL							
CODE	SPECIFIC LEARNING OUTCOMES	TOPIC	Cognitive	Psychomotor	Attitude	MIT	AT
	intramembranous and endochondral ossification.						



Module no. 6

Neurosciences - I



MODULE RATIONALE

The Neurosciences module introduces students to the structural and functional organization of the nervous system and its direct relevance to dental practice. Understanding neural control of sensory, motor, and autonomic functions is critical for interpreting pain pathways, reflexes, and neuromuscular coordination in the head and neck region. This module integrates anatomy, physiology, biochemistry, pharmacology, pathology, and microbiology to provide a comprehensive understanding of neuronal signaling, neurotransmission, autonomic regulation, and common neurological disorders. Students also explore clinical conditions such as trigeminal neuralgia, facial nerve palsy, meningitis, and neuropathies to strengthen their ability to correlate theoretical knowledge with clinical application.

MODULE OUTCOMES

- Describe the gross and microscopic organization of the central and peripheral nervous systems, including neurons, neuroglia, receptors, and effectors.
- Explain the structural and functional components of spinal cord, brainstem, cerebellum, cerebrum, and cranial nerves.
- Identify the major ascending and descending tracts and correlate their lesions with clinical signs and symptoms.
- Differentiate upper and lower motor neuron lesions based on anatomical and physiological principles.
- Discuss the formation, circulation, and absorption of cerebrospinal fluid (CSF) and its role in maintaining intracranial homeostasis.
- Explain the physiological basis of synaptic transmission, neural conduction, sensory processing, and reflex mechanisms.
- Interpret somatosensory and pain pathways with emphasis on trigeminal sensory systems and dental pain physiology.
- Relate motor control to the organization and function of the motor cortex, cerebellum, and basal ganglia.
- Describe the biochemical basis of neurotransmitter synthesis, release, and inactivation, and relate disorders such as Parkinson's disease and Alzheimer's to molecular mechanisms.
- Explain the pharmacodynamics of drugs acting on the autonomic nervous system, including neurotransmitter regulation and receptor types.

- Discuss major neuropathologies such as meningitis, multiple sclerosis, and demyelinating diseases, along with their microbiological and pathological aspects.
- Perform basic cranial nerve examinations and demonstrate clinical localization of neurological function relevant to dentistry.

SUBJECTS INTEGRATED IN THE MODULE

1. Anatomy
2. Physiology
3. Biochemistry
4. Pharmacology & Therapeutics
5. General Pathology & Microbiology

THEORY

ANATOMY

COD E	SPECIFIC LEARNING OUTCOMES	TOPIC	Cognitive	Attitude	MI T	AT	Video Links
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	C1	A2	LGIS /SGD	MCQS	https://youtu.be/RNLceVI8jcc
NS-A-002	Define neuron and discuss its structure.	Neuron	C2	A2	LGIS /SGD	MCQS	https://youtu.be/qOmmqu6_g3s
NS-A-003	Classify neurons morphologically and	Neuron Classification	C2	A2	LGIS /SGD	MCQS	https://youtu.be/X4uuCgElLK8

ANATOMY							
COD E	SPECIFIC LEARNING OUTCOMES	TOPIC	Cognitive	Attitude	MI T	AT	Video Links
	functionally with examples.						
NS-A-004	Discuss components of central and peripheral nervous system.	CNS & PNS Overview	C2	A2	LGIS /SGD	MCQS	https://youtu.be/Qh6A1neljbl
NS-A-005	Give the supporting cells in central and peripheral nervous system.	Neuroglia	C2	A2	LGIS /SGD	MCQS	https://youtu.be/-PHYkztLwEw
NS-A-006	Define & classify receptors and effectors.	Receptors and Effectors	C1	A2	LGIS /SGD	MCQS	https://youtu.be/www-iCp8b2pY
NS-A-007	Highlight major subdivisions of ANS into sympathetic and parasympathetic nervous system with comparison of anatomical differences.	Sympathetic vs. Parasympathetic System	C4	A2	LGIS /SGD	MCQS	https://youtu.be/DPWEhl7gbu4
NS-A-008	Enlist all cranial nerves and their distribution.	Cranial Nerves	C1	A2	LGIS /SGD	MCQS	https://youtu.be/hDbWV0EZCAU
NS-A-009	Give the classification, structure, and functions of peripheral nerve fibers in a typical spinal nerve.	Spinal Nerve Anatomy	C2	A2	LGIS /SGD	MCQS	https://youtu.be/6XtPzcXAqBc
NS-A-010	Define dermatome.	Dermatome	C1	A2	LGIS /SGD	MCQS	https://youtu.be/kJHXs0jee9M

ANATOMY							
COD E	SPECIFIC LEARNING OUTCOMES	TOPIC	Cognitive	Attitude	MI T	AT	Video Links
NS-A-011	Enlist the parts of the brain. Enumerate their major functions.	Brain Regions & Functions	C1	A2	LGIS /SGD	MCQS	https://youtu.be/KtoQnFWEgMY
NS-A-012	Identify the location, extent, coverings, and blood supply of spinal cord.	Spinal Cord Overview	C2	A2	LGIS /SGD	MCQS	https://youtu.be/KnD16gwpCz8
NS-A-013	Tabulate nuclear organization at different levels of spinal cord.	Spinal Cord Nuclei	C2	A2	LGIS /SGD	MCQS	https://www.youtube.com/watch?v=4H_2JRRzha4
NS-A-014	Draw & label the transverse section of spinal cord at mid cervical level showing ascending & descending tracts.	Spinal Cord Cross-Section	C3	A2	LGIS /SGD	MCQS	https://youtu.be/KnD16gwpCz8
NS-A-015	Define gray & white matter and differentiate amongst Fasciculus tract & Lemniscus tract.	Spinal Cord Gray & White Matter	C4	A2	LGIS /SGD	MCQS	https://youtu.be/KnD16gwpCz8
NS-A-016	Give the external feature of brain stem.	Mid Brain, Pons, Medulla & its Blood Supply	C2	A2	LGIS /SGD	MCQS	https://youtu.be/vzj371hWxEo
NS-A-017	Draw & Label cross-sections of the brainstem at the levels of the midbrain, pons, and medulla.	Brainstem Cross Sectional Anatomy	C3	A2	LGIS /SGD	MCQS	https://youtu.be/hixOWQuUCo4
NS-A-018	Discuss the location of cranial nerve nuclei, their functional	Cranial Nerve Nuclei and Pathways	C4	A2	LGIS /SGD	MCQS	https://youtu.be/hDbWV0EZCAU

ANATOMY							
COD E	SPECIFIC LEARNING OUTCOMES	TOPIC	Cognitive	Attitude	MI T	AT	Video Links
	components, and distribution, and its exit from respective skull foramina.						
NS-A-019	Identify the lobes of cerebellum.	Cerebellar Lobes	C1	A2	LGIS /SGD	MCQS	https://youtu.be/3yn5V-pYe5o
NS-A-020	Define important clinical correlates, vermis syndrome, ataxia, dysarthria, dysdiadochokinesia, nystagmus, and vertigo.	Cerebellar Clinical Correlates	C2	A3	LGIS /SGD	MCQS	https://youtu.be/ldDKz1opCD8
NS-A-021	Discuss internal structure of cerebral hemisphere (white matter, basal ganglia, lateral ventricle).	Cerebral Hemisphere Structure	C2	A2	LGIS /SGD	MCQS	https://youtu.be/WiLhAOaBkSA
NS-A-022	Briefly explain ventricular system (Lateral, 3rd & 4th ventricles).	Ventricular System	C2	A2	LGIS /SGD	MCQS	https://youtu.be/P49ZJWpu06k
NS-A-023	Briefly explain various parts of internal capsule.	Internal Capsule	C2	A2	LGIS /SGD	MCQS	https://youtu.be/fG0frRnQRjU
NS-A-024	Draw and label the formation of Circle of Willis.	Circle of Willis	C3	A2	LGIS /SGD	MCQS	https://youtu.be/9hhfM7rQHiM
NS-A-025	Explain meninges of the brain.	Meninges	C2	A2	LGIS /SGD	MCQS	https://youtu.be/XSMPB7y41E8
NS-A-026	Give the location, origin and termination of dural venous sinuses.	Dural Venous Sinuses	C2	A2	LGIS /SGD	MCQS	https://youtu.be/TX5Fxr4SD4

ANATOMY							
COD E	SPECIFIC LEARNING OUTCOMES	TOPIC	Cognitive	Attitude	MI T	AT	Video Links
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	C4	A3	LGIS /SGD	MCQS	https://youtu.be/xnZnrottTNO
NS-A-028	Discuss the anatomical basis of extradural, subdural and subarachnoid hemorrhages.	Intracranial Hemorrhages	C4	A3	LGIS /SGD	MCQS	https://youtu.be/Kb_wzb7-rvE
NS-A-029	Explain the formation, circulation and absorption of CSF (Cerebrospinal fluid).	CSF Physiology	C2	A2	LGIS /SGD	MCQS	https://youtu.be/asQo6cmOjd0
NS-A-030	Discuss the origin, course, branches and distribution of internal carotid and vertebral artery.	Brain Blood Supply	C2	A2	LGIS /SGD	MCQS	https://youtu.be/QYmApwTicHs
NS-A-031	Enlist the nuclei of thalamus and hypothalamus along with its functions & connections.	Thalamus & Hypothalamus Connections	C2	A2	LGIS /SGD	MCQS	https://youtu.be/5BvVjjs664w

PHYSIOLOGY							
CODE	SPECIFIC LEARNING OUTCOMES	TOPIC	Cognitive	Attitude	MI T	AT	Video Links
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 Nervous System, Basic Functions of Synapses, and Neurotransmitters	C4	A2	LGIS /SGD	MCQS	https://youtu.be/cZwb8zqAPXc
NS-P-002	Define and classify the sensory receptors in the body on the basis of stimuli they detect.	Sensory Receptors, Neuronal Circuits	C2	A2	LGIS /SGD	MCQS	https://www.youtube.com/results?search_query=Sensory+receptors+classification+stimuli+detected+physiology
NS-P-003	Discuss tonic and phasic receptors with 2 to 3 examples of each.	For Processing Information	C2	A2	LGIS /SGD	MCQS	https://www.youtube.com/results?search_query=Tonic+and+Phasic+receptors+sensory+adaptation+physiology

PHYSIOLOGY							
CODE	SPECIFIC LEARNING OUTCOMES	TOPIC	Cognitive	Attitude	MIT	AT	Video Links
NS-P-004	Classify the nerve fibers on the basis of diameter and speed of conduction.	Receptors Transduction of Sensory Stimuli into Nerve Impulses	C2	A2	LGIS /SGD	MCQS	https://www.youtube.com/results?search_query=Classification+of+nerve+fibers+diameter+conduction+velocity+physiology
NS-P-005	Classify somatic sensations. Explain two main ascending pathways (DCML and Anterolateral system) for 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.	Somatosensory Cortex	C4	A2	LGIS /SGD	MCQS	https://www.youtube.com/results?search_query=Somatic+sensation+dorsal+column+medial+lemniscus+anterolateral+pathway+physiology https://youtu.be/Gif06CwhZxk
NS-P-006	Tabulate the sensory nerve endings, and anatomical sites of first, second, third order neurons of ascending tracts.	Ascending Tracts	C2	A2	LGIS /SGD	MCQS	https://www.youtube.com/watch?v=b9VxxjvuZEw https://www.youtube.com/watch?v=d1jA-UZvi_M

PHYSIOLOGY							
CODE	SPECIFIC LEARNING OUTCOMES	TOPIC	Cognitive	Attitude	MI T	AT	Video Links
NS-P-007	Trace the descending tracts.	Descending Tracts	C3	A2	LGIS /SGD	MCQS	https://youtu.be/4omutQo08nw
NS-P-008	Differentiate clearly between upper and lower motor neuron lesions.	UMN vs. LMN Lesions	C4	A3	LGIS /SGD	MCQS	https://www.youtube.com/watch?v=lwTeoVZPuJM
NS-P-009	Identify the lobes, sulci & gyri.	Cerebral Cortex Anatomy	C2	A2	LGIS /SGD	MCQS	https://www.youtube.com/watch?v=Gu3xcgJslBo
NS-P-010	Describe functional areas of cerebrum.	Functional Cortex	C2	A2	LGIS /SGD	MCQS	https://youtu.be/sPSmtAaNJ_U
NS-P-011	Define and give physiological basis of referred pain with two examples. Define Trigeminal Neuralgia.	Referred Pain & Trigeminal Neuralgia	C2	A3	LGIS /SGD	MCQS	https://www.youtube.com/results?search_query=trigeminal+neuralgia+referred+pain+osmosis
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. Name the descending motor tracts. Describe the functions of corticospinal tract.	Cortical and Brain Stem Control of Motor Function	C2	A2	LGIS /SGD	MCQS	https://www.youtube.com/results?search_query=Ninja+NERD+Motor+Cortex+Corticospinal+Tract
NS-P-013	Give functional organization of spinal cord.	Spinal Cord Motor Functions and Reflexes	C2	A2	LGIS /SGD	MCQS	https://www.youtube.com/watch?v=uQdf7PtdP2w

PHYSIOLOGY							
CODE	SPECIFIC LEARNING OUTCOMES	TOPIC	Cognitive	Attitude	MI T	AT	Video Links
	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.						
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	C4	A3	LGIS /SGD	MCQS	https://youtu.be/Mx0kMD6Dewo
NS-P-015	Enlist the components of limbic system and its general functions. Enlist functions of different portions of hypothalamus. Explain the physiological basis and features of Alzheimer's disease.	The Limbic System and the Hypothalamus	C2	A3	LGIS /SGD	MCQS	https://www.youtube.com/results?search_query=Ninja+Nerd+Limbic+System+Hypothalamus https://www.youtube.com/results?search_query=Osmosis+Alzheimer%27s+Disease
NS-P-016	Define memory. Classify memory on the basis of duration and information stored.	Memory	C2	A2	LGIS /SGD	MCQS	https://www.youtube.com/results?search_query=Ninja+Nerd+Memory+Physiology
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	C2	A2	LGIS /SGD	MCQS	https://www.youtube.com/watch?v=7dZHmKMLdCQ https://youtu.be/7dZHmKMLdCQ https://youtu.be/afzWLmd72Rk

PHYSIOLOGY							
CODE	SPECIFIC LEARNING OUTCOMES	TOPIC	Cognitive	Attitude	MI T	AT	Video Links
NS-P-018	Enlist the functions of CSF.	Cerebral Circulation	C1	A2	LGIS /SGD	MCQS	https://www.youtube.com/results?search_query=Ninja+Nerd+Cerebrospinal+Fluid+CSF
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	C2	A2	LGIS /SGD	MCQS	https://youtu.be/fj8Sggl305c https://youtu.be/AgS5bbhuc2Y
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	C4	A3	LGIS /SGD	MCQS	https://www.youtube.com/watch?v=7upHDhAmkqU
NS-P-021	Enlist the primary taste sensations. 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	C3	A2	LGIS /SGD	MCQS	https://youtu.be/FXPcOUrZgwg https://youtu.be/XCPzPFLn3s0 https://youtu.be/VoZ4oyikyUs

BIOCHEMISTRY							
COD E	SPECIFIC LEARNING OUTCOMES	TOPIC	Cognitive	Attitude	MIT	AT	Video Links
NS-B-001	Elaborate the structure of mannitol & give its clinical uses.	Osmotic Diuretic	C4	A3	LGIS/SG D	MCQ S	https://www.youtube.com/watch?v=NBXObk7TIWk
NS-B-002	Discuss neuropathies associated with deficiency/toxicity of B1, B6 & B12.	Neuropathies	C2	A3	LGIS/SG D	MCQ S	https://www.youtube.com/watch?v=t-lNLY9HYy0 https://www.youtube.com/watch?v=PTA3h_S4FZ8 https://www.youtube.com/watch?v=TNug0MHdhq0 https://www.youtube.com/watch?v=7HqHq6n7rwM
NS-B-003	Explain the biosynthesis, mechanism of action, and physiological role of acetylcholine, and discuss the clinical consequences of its deficiency. Outline the reactions involved in biosynthesis of catecholamines. Elaborate the mechanism of action of catecholamines.	Neurotransmitters	C4	A2	LGIS/SG D	MCQ S	https://www.youtube.com/watch?v=MJECqcYJhmo https://www.youtube.com/watch?v=LOHKVp8hn7o https://www.youtube.com/watch?v=AizcazPRwRk

BIOCHEMISTRY							
COD E	SPECIFIC LEARNING OUTCOMES	TOPIC	Cognitive	Attitude	MIT	AT	Video Links
NS-B-004	Briefly describe the cause, clinical features & management of Phenylketonuria. Outline the metabolism of branched chain amino acids (BCAA). Briefly describe the cause, clinical features & management of maple syrup urine disease (MSUD).	Inherited Disorders of Amino Acid Metabolism	C2	A3	LGIS/SG D	MCQ S	https://www.youtube.com/watch?v=HYg0ld-C0uQ https://www.youtube.com/watch?v=6Kl_XX-lo https://www.youtube.com/watch?v=S3VE7K5DEgo
NS-B-005	Briefly describe the consequences of protein misfolding (Alzheimer's disease and prion diseases).	Protein Misfolding	C2	A3	LGIS/SG D	MCQ S	https://www.youtube.com/watch?v=AkN16QDCClg https://www.youtube.com/watch?v=AlAc5Fvv5u0

PHARMACOLOGY & THERAPEUTICS							
CO DE	SPECIFIC LEARNING OUTCOMES	TOPIC	Cognitive	Attitude	MIT	AT	Video Links
NS-Ph001	Describe the synthesis, storage, release and degradation of acetylcholine and norepinephrine of the ANS. Classify types of autonomic receptor (adrenergic and cholinergic) along with their location, actions and post receptor mechanism.	Introduction to ANS	C2	A2	LGIS/SGD	MCQS	https://www.youtube.com/results?search_query=Ninja+Nerd+Autonomic+Nervous+System+Pharmacology
NS-Ph002	Classify and name the prototype drugs acting on the autonomic nervous system according to their site and mechanism of action.	Classification	C2	A3	LGIS/SGD	MCQS	https://www.youtube.com/results?search_query=Ninja+Nerd+Autonomic+Pharmacology+Classification+of+Drugs

GENERAL PATHOLOGY & MICROBIOLOGY							
CO DE	SPECIFIC LEARNING OUTCOMES	TOPIC	Cognitive	Attitude	MIT	AT	Video Links
NS-Pa001	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 epidemiology, transmission, virulence factors, pathogenesis,	Infections of CNS	C4	A3	LGIS/SGD	MCQS	https://www.youtube.com/results?search_query=Ninja+Nerd+Microbiology+Infectious+Diseases+Playlist

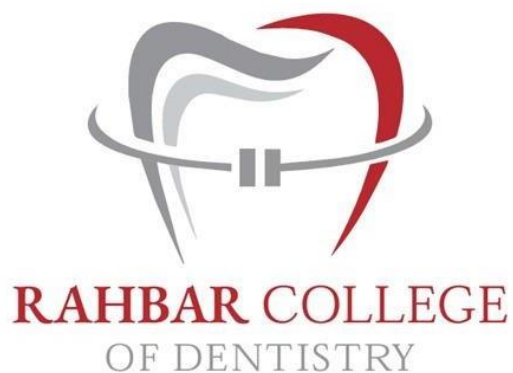
GENERAL PATHOLOGY & MICROBIOLOGY							
CO DE	SPECIFIC LEARNING OUTCOMES	TOPIC	Cognitive	Attitude	MIT	AT	Video Links
	laboratory diagnosis, and prevention of Streptococcus pneumoniae, Treponema pallidum, herpes simplex virus, varicella zoster virus, Clostridium tetani, Clostridium botulinum, and Spirochetes.						
NS-PaO 02	Define concussion and contusion. Enlist their clinical features.	Trauma to CNS	C2	A3	LGIS /SGD	MCQS	https://www.youtube.com/results?search_query=Osmosis+Concussion+vs+Contusion
NS-PaO 03	Enumerate various demyelinating diseases of CNS. Enlist clinical features and diagnosis of Multiple Sclerosis & Guillain-Barre syndrome.	Demyelinating Diseases of CNS	C4	A3	LGIS /SGD	MCQS	https://www.youtube.com/results?search_query=Osmosis+Multiple+Sclerosis+Guillain+Barre+Syndrome

PRACTICALS / LAB WORK

NEUROANATOMY — PRACTICAL							
CODE	SPECIFIC LEARNING OUTCOMES	TOPIC	Cognitive	Psychomotor	Attitude	MIT	AT
NS-A-036	Demonstrate gross neuroanatomical knowledge of the brain and brainstem with particular focus on the cranial nerves, including identification of their origin,	Nervous System	C4	P3	A3	Demonstration	OSPE/OSVE

NEUROANATOMY — PRACTICAL							
CODE	SPECIFIC LEARNING OUTCOMES	TOPIC	Cognitive	Psychomotor	Attitude	MIT	AT
	course, nuclei, associated foramina, functional components, and clinical correlations using anatomical models and dissected cadaveric specimens.						

PHYSIOLOGY — PRACTICAL							
CODE	SPECIFIC LEARNING OUTCOMES	TOPIC	Cognitive	Psychomotor	Attitude	MIT	AT
NS-P-022	Examination of trigeminal nerve.	CN V	C3	P3	A3	Demonstration	OSPE/OSVE
NS-P-023	Examination of facial nerve.	CN VII	C3	P3	A3	Demonstration	OSPE/OSVE
NS-P-024	Examination of 9th, 10th, 11th & 12th nerve.	CN IX, X, XI, XII	C3	P3	A3	Demonstration	OSPE/OSVE
NS-P-025	Demonstrate Plantar reflex.	Motor System	C3	P3	A3	Demonstration	OSPE/OSVE
NS-P-026	Demonstrate deep tendon reflex.	Motor System	C3	P3	A3	Demonstration	OSPE/OSVE



Module no. 7

ALVEOLOCEMENTAL COMPLEX - I



ALVEO-CEMENTAL COMPLEX-1

MODULE RATIONALE

The Alveolo-Cemental Complex module provides students with an integrated understanding of the structures that anchor and support teeth within the jaws. It explores the anatomy, histology, physiology, and pathology of the periodontium — including cementum, periodontal ligament, alveolar bone, and gingiva — and their collective role in maintaining oral health and function. Students also learn about tooth eruption, movement, and shedding, emphasizing the developmental and adaptive processes that sustain the dentition throughout life. By linking biological foundations with clinical disciplines such as periodontology, radiology, and community dentistry, this module equips students to recognize the early signs of periodontal disease, interpret radiographic changes, and apply preventive and therapeutic principles in dental practice.

MODULE OUTCOMES

- Describe the structure, composition, and functions of the periodontium and its components — cementum, periodontal ligament, alveolar bone, and gingiva.
- Explain the development, maturation, and age-related changes of supporting dental tissues.
- Differentiate between cellular and acellular cementum and discuss their roles in tooth attachment and repair.
- Identify the organization and fiber groups of the periodontal ligament and relate their orientation to masticatory function and tooth movement.
- Describe the histology and functional characteristics of gingival tissues, including epithelial zones and dentogingival and mucogingival junctions.
- Explain the mechanisms and phases of tooth eruption, movement, and shedding, and recognize factors causing abnormalities.
- Discuss the vascular, neural, and biochemical components of the supporting structures and their relevance to dental practice.
- Describe the pathological basis of acute and chronic inflammation as it relates to periodontal disease, and identify key microorganisms involved.
- Recognize the microbial and biochemical factors contributing to plaque and calculus formation, and their roles in periodontal disease progression.

- Demonstrate mechanical plaque control techniques such as brushing and flossing, emphasizing prevention and maintenance of periodontal health.
- Interpret radiographic features of the normal periodontium and identify radiological signs of periodontal disease.
- Apply periodontal and oral health indices (Plaque Index, Gingival Index, CPI, CPITN) to assess and monitor oral health status in community settings.

1. Oral Biology & Tooth Morphology 2. General Pathology & Microbiology 3. Periodontology 4. Dental Radiology 5. Community & Preventive Dentistry

THEORY

ORAL BIOLOGY & TOOTH MORPHOLOGY							
CODE	SPECIFIC LEARNING OUTCOMES	TOPIC	Cognitive	Attitude	MI T	AT	Video Links
ALC-OB001	Define the alveolo-cemental complex (periodontium) and explain its role in dental support.	Periodontium Overview	C2	A2	LGIS /SGD	MCQS	https://youtu.be/QuSJlQdOoko
ALC-OB002	Identify its components (cementum, PDL, alveolar bone, gingiva) and their	Components of Periodontium	C2	A2	LGIS /SGD	MCQS	https://youtu.be/QuSJlQdOoko

ORAL BIOLOGY & TOOTH MORPHOLOGY							
CODE	SPECIFIC LEARNING OUTCOMES	TOPIC	Cognitive	Attitude	MI T	AT	Video Links
	diagrammatic arrangement around the tooth.						
ALC-OB003	Define cementum and explain its biochemical properties. Classify, explain and differentiate between different types of cementum and its properties.	Cementum	C4	A2	LGIS /SGD	MCQS	https://www.youtube.com/results?search_query=Dr+Najeeb+Cementum+Oral+Histology
ALC-OB004	Describe the process of cementogenesis. Explain molecular factors associated with cementogenesis.	Cementogenesis	C2	A2	LGIS /SGD	MCQS	https://www.youtube.com/results?search_query=Cementogenesis+Oral+Histology
ALC-OB005	Classify and explain the structure of different types of cementum and their properties.	Types of Cementum	C4	A2	LGIS /SGD	MCQS	https://youtu.be/GQho-DhvBoc
ALC-OB006	Explain age-related changes of cementum.	Age-Related Changes of Cementum	C2	A2	LGIS /SGD	MCQS	https://www.youtube.com/results?search_query=Cementum+Oral+Histology+Age+Changes
ALC-OB007	Describe cements enamel junction (CEJ) and attachment of cementum onto dentin.	CEJ	C2	A2	LGIS /SGD	MCQS	https://www.youtube.com/results?search_query=Cements+enamel+Junction+CEJ+Oral+Histology
ALC-OB008	Differentiate between the structure of cellular and acellular cementum.	Cellular vs Acellular Cementum	C4	A2	LGIS /SGD	MCQS	https://youtu.be/luDQ2nbc68g
ALC-OB009	Describe the structure and functions of alveolar bone.	Alveolar Bone — Structure and Function	C2	A2	LGIS /SGD	MCQS	https://www.youtube.com/results?search_query=Alveolar+Bone+Oral+Histology

ORAL BIOLOGY & TOOTH MORPHOLOGY							
CODE	SPECIFIC LEARNING OUTCOMES	TOPIC	Cognitive	Attitude	MI T	AT	Video Links
ALC-OB010	Elaborate its changes with age and its clinical considerations.	Alveolar Bone — Structure and Function	C2	A3	LGIS /SGD	MCQS	https://www.youtube.com/results?search_query=Alveolar+Bone+Age+Changes+Oral+Histology
ALC-OB011	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	C2	A3	LGIS /SGD	MCQS	https://youtu.be/HnALH1wsGOA
ALC-OB012	Discuss the development of periodontal ligament (PDL).	Development of PDL	C2	A2	LGIS /SGD	MCQS	https://www.youtube.com/results?search_query=Periodontal+Ligament+Development+Oral+Histology
ALC-OB013	Enlist the structure and function of the periodontal ligament.	PDL Structure & Function	C2	A2	LGIS /SGD	MCQS	https://www.youtube.com/results?search_query=Periodontal+Ligament+Structure+and+Functions+Oral+Histology
ALC-OB014	Describe the cellular component of PDL.	PDL Cellular Component	C2	A2	LGIS /SGD	MCQS	https://www.youtube.com/results?search_query=Periodontal+Ligament+cells+fibers+functions+oral+histology
ALC-OB015	Describe the principal fiber bundles of PDL.	PDL Fiber Bundles	C2	A2	LGIS /SGD	MCQS	https://youtu.be/3f-kM-Pm0xg

ORAL BIOLOGY & TOOTH MORPHOLOGY							
CODE	SPECIFIC LEARNING OUTCOMES	TOPIC	Cognitive	Attitude	MI T	AT	Video Links
							https://youtu.be/M-IWhSbCwok
ALC-OB016	Describe the adaptation of the periodontal ligament to the functional demands.	Functional Adaptation of Periodontal Ligament	C2	A2	LGIS /SGD	MCQS	https://www.youtube.com/results?search_query=Periodontal+Ligament+functional+adaptation+oral+histology
ALC-OB017	Describe the blood supply and nerve supply of PDL.	Blood and Nerve Supply of PDL	C2	A2	LGIS /SGD	MCQS	https://www.youtube.com/results?search_query=Periodontal+Ligament+blood+supply+nerve+supply+oral+histology
ALC-OB018	Describe the mechanisms of PDL cell recruitment during tissue turnover and repair.	PDL Remodeling and Regeneration	C2	A2	LGIS /SGD	MCQS	https://www.youtube.com/results?search_query=Periodontal+Ligament+remodeling+repair+regeneration+oral+histology
ALC-OB019	Describe the histological aspects of gingiva.	Gingival Histology	C2	A2	LGIS /SGD	MCQS	https://www.youtube.com/results?search_query=Gingiva+Histology+Oral+Histology
ALC-OB020	Enumerate gingival fibers & their functions.	Gingival Fibers	C2	A2	LGIS /SGD	MCQS	https://www.youtube.com/results?search_query=Gingival+fibers+oral+histology
ALC-OB021	Tabulate blood and nerve supply of gingiva.	Gingival Blood and Nerve Supply	C2	A2	LGIS /SGD	MCQS	https://www.youtube.com/results?search_query=Gingiva+blood+supply+ne

ORAL BIOLOGY & TOOTH MORPHOLOGY							
CODE	SPECIFIC LEARNING OUTCOMES	TOPIC	Cognitive	Attitude	MIT	AT	Video Links
							rve+supply+oral+histology
ALC-OB022	Describe the structural and functional characteristics of different areas of gingival epithelium.	Gingival Epithelium	C2	A2	LGIS /SGD	MCQS	https://www.youtube.com/results?search_query=Gingival+epithelium+oral+histology
ALC-OB023	Describe gingival sulcus and explain the development and structure of dentogingival junction (DEJ).	Dentogingival Junction	C2	A2	LGIS /SGD	MCQS	https://www.youtube.com/results?search_query=Dentogingival+junction+gingival+sulcus+oral+histology
ALC-OB024	Explain the histological mechanisms of repair at the DEJ.	Healing and Regeneration of the DEJ	C2	A2	LGIS /SGD	MCQS	https://www.youtube.com/results?search_query=Junctional+epithelium+periodontal+wound+healing+oral+histology
ALC-OB025	Explain the structure of mucogingival junction.	Mucogingival Junction	C2	A2	LGIS /SGD	MCQS	https://www.youtube.com/results?search_query=Mucogingival+Junction+MGJ+Oral+Histology
ALC-OB026	Describe eruption and phases of tooth movement. Elaborate pre-eruptive tooth movement.	Tooth Eruption Phases & Pre-Eruptive Tooth Movement	C2	A2	LGIS /SGD	MCQS	https://www.youtube.com/results?search_query=Tooth+eruption+phases+pre+eruptive+tooth+movement+oral+histology
ALC-OB027	Discuss the mechanism and factors responsible for eruptive tooth movement.	Eruptive Tooth Movement Mechanisms	C4	A2	LGIS /SGD	MCQS	https://www.youtube.com/results?search_query=Mechanism+of+tooth+eruption+factors+affecting+eruption+oral+histology

ORAL BIOLOGY & TOOTH MORPHOLOGY							
CODE	SPECIFIC LEARNING OUTCOMES	TOPIC	Cognitive	Attitude	MI T	AT	Video Links
ALC-OB028	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	C2	A2	LGIS /SGD	MCQS	https://www.youtube.com/results?search_query=Post+eruptive+tooth+movement+mechanism+significance+oral+histology
ALC-OB029	Discuss histology and causes of tooth shedding.	Tooth Shedding	C4	A2	LGIS /SGD	MCQS	https://www.youtube.com/results?search_query=Tooth+shedding+exfoliation+histology+mechanism+oral+histology

PATHOLOGY & MICROBIOLOGY							
CODE	SPECIFIC LEARNING OUTCOMES	TOPIC	Cognitive	Attitude	MI T	AT	Video Links
ALC-Pa001	Define acute inflammation and its pathological basis relevant to dental conditions.	Acute Inflammation in Dental Conditions	C2	A2	LGIS /SGD	MCQS	https://www.youtube.com/watch?v=HrFb0axfGY https://www.youtube.com/watch?v=VK6lvalO6GQ
ALC-Pa002	Enlist stimuli for acute inflammation, including microbes, trauma, and chemical irritants relevant to oral infections.	Stimuli of Acute Inflammation in Oral Health	C2	A2	LGIS /SGD	MCQS	https://www.youtube.com/watch?v=yIMz9pkT9xQ

PATHOLOGY & MICROBIOLOGY							
CODE	SPECIFIC LEARNING OUTCOMES	TOPIC	Cognitive	Attitude	MI T	AT	Video Links
ALC-Pa003	Classify chemical mediators of acute inflammation and their role in dental diseases such as dental abscess formation.	Chemical Mediators of Acute Inflammation in Dentistry	C4	A3	LGIS /SGD	MCQS	https://www.youtube.com/watch?v=Xdlhx4pHEQ
ALC-Pa004	Explain vascular and cellular events in acute inflammation and its relation to dental conditions like pulpitis and periodontitis.	Vascular and Cellular Events in Acute Inflammation	C4	A3	LGIS /SGD	MCQS	https://www.youtube.com/watch?v=KSoeWgMidbA
ALC-Pa005	Describe systemic effects of acute inflammation, such as fever and leukocytosis, and their impact on dental treatment.	Systemic Effects of Acute Inflammation	C2	A3	LGIS /SGD	MCQS	https://www.youtube.com/results?search_query=Acute+Inflammation+systemic+effects+fever+leukocytosis+pathology
ALC-Pa006	Identify and explain the role of microbes causing acute inflammation in dental infections, such as Streptococcus mutans and Porphyromonas gingivalis.	Microbes Causing Dental Infections	C4	A3	LGIS /SGD	MCQS	https://www.youtube.com/watch?v=m_OgsHp15SQ
ALC-Pa007	Analyze morphological patterns of acute inflammation, such as purulent or fibrinous types, in oral diseases.	Morphological Patterns of Acute Inflammation in Oral Diseases	C4	A2	LGIS /SGD	MCQS	https://www.youtube.com/watch?v=1LuJOKrPso8
ALC-Pa008	Define chronic inflammation and its significance in persistent oral and systemic conditions.	Chronic Inflammation and Its Oral/Systemic Significance	C2	A2	LGIS /SGD	MCQS	https://www.youtube.com/watch?v=PYglgwgl7_g

PATHOLOGY & MICROBIOLOGY							
CODE	SPECIFIC LEARNING OUTCOMES	TOPIC	Cognitive	Attitude	MIT	AT	Video Links
ALC-Pa009	Identify chronic inflammatory cells, such as macrophages and lymphocytes, and mediators like TNF- α and IL-1.	Chronic Inflammatory Cells and Mediators	C4	A2	LGIS /SGD	MCQS	https://www.youtube.com/results?search_query=Chronic+inflammation+macrophages+lymphocytes+TNF+alpha+IL+1+pathology
ALC-Pa010	Discuss Porphyromonas and Fusobacterium with its pathogenesis.	Pathogenesis of Porphyromonas and Fusobacterium	C4	A2	LGIS /SGD	MCQS	https://www.youtube.com/results?search_query=Porphyromonas+gingivalis+Fusobacterium+nucleatum+pathogenesis+oral+microbiology

PERIODONTOLOGY							
CODE	SPECIFIC LEARNING OUTCOMES	TOPIC	Cognitive	Attitude	MIT	AT	Video Links
ALC-Pe001	Define key terminologies related to periodontal diseases: Gingivitis, periodontitis, periodontal pockets, clinical attachment level and periodontal bone loss.	Periodontal Disease Terminology	C1	A2	LGIS /SGD	MCQS	https://youtu.be/H6HYI9XrHU
ALC-Pe002	Define & classify periodontal diseases.	Periodontal Disease	C2	A2	LGIS /SGD	MCQS	https://youtu.be/H6HYI9XrHU

PERIODONTOLOGY							
CODE	SPECIFIC LEARNING OUTCOMES	TOPIC	Cognitive	Attitude	MI T	AT	Video Links
ALC-Pe003	Identify the microbial composition of healthy gingival and periodontal tissues.	Healthy Microbial Composition and Periodontal Homeostasis	C2	A2	LGIS /SG D	MCQS	https://www.youtube.com/results?search_query=Microbial+composition+of+healthy+gingiva+and+periodontium+periodontology
ALC-Pe004	Enlist key red complex bacterial species involved in periodontal disease (e.g., Porphyromonas gingivalis, Tannerella forsythia, Treponema denticola).	Pathogenic Bacterial Species in Periodontal Disease	C1	A2	LGIS /SG D	MCQS	https://www.youtube.com/results?search_query=Red+complex+bacteria+Porphyromonas+gingivalis+Tannerella+forsythia+Treponema+denticola+periodontology
ALC-Pe005	What is plaque biofilm and how is it formed and what is its role in periodontal diseases.	Plaque Biofilm Formation and Role in Disease	C2	A3	LGIS /SG D	MCQS	https://www.youtube.com/results?search_query=Dental+plaque+biofilm+formation+role+in+periodontal+disease+periodontology
ALC-Pe006	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.	Plaque Biofilm Formation and Role in Disease	C4	A3	LGIS /SG D	MCQS	https://youtu.be/xrmTu6LeQd8
ALC-Pe007	Explain the adherent nature of dental plaque and why it is not easily visualized. Describe the importance of plaque disclosure and justify the need for mechanical plaque removal	Plaque Visualization, Disclosure, and	C4	A3	LGIS /SG D	MCQS	https://www.youtube.com/results?search_query=Dental+plaque+disclosing+agents+plaque+c

PERIODONTOLOGY							
CODE	SPECIFIC LEARNING OUTCOMES	TOPIC	Cognitive	Attitude	MI T	AT	Video Links
	by both the patient and oral health professionals.	Mechanical Removal					ontrol+periodontology
ALC-Pe008	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	C4	A3	LGIS /SG D	MCQS	https://youtu.be/hrbJ3w5eKo
ALC-Pe009	Enlist other predisposing factors (other than calculus) that predispose to plaque formation and consequent periodontal disease like gingivitis.	Other Predisposing Factors for Plaque Formation	C2	A2	LGIS /SG D	MCQS	https://www.youtube.com/results?search_query=Local+factors+predisposing+to+plaque+accumulation+periodontology
ALC-Pe010	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	C4	A3	LGIS /SG D	MCQS	https://youtu.be/V-sCj13br74
ALC-Pe011	Enlist methods of plaque removal techniques.	Plaque Removal Techniques	C2	A3	LGIS /SG D	MCQS	https://www.youtube.com/results?search_query=Plaque+control+methods+mechanical+chemical+plaque+removal+periodontology

DENTAL RADIOLOGY							
CO D E	SPECIFIC LEARNING OUTCOMES	TOPIC	Cog niti ve	Attitude	MIT	AT	Video links
ALC - DR 001	Define the role of radiology in diagnosing and assessing periodontal diseases. Explain radiological features of healthy periodontium.	Role of Radiology in Periodontal Disease	C2	A2	LGIS/ SGD	MCQS	https://www.youtube.com/results?search_query=Radiographic+features+healthy+periodontium+role+of+radiology+in+periodontal+disease+oral+radiology
ALC - DR 002	Interpret key radiographic signs of periodontal disease, including crestal bone loss, widening of the periodontal ligament space, and calculus deposits.	Interpretation of Radiographic Signs in Periodontal Disease	C4	A3	LGIS/ SGD	MCQS	https://www.youtube.com/results?search_query=Radiographic+features+of+periodontal+disease+crestal+bone+loss+PDL+space+calculus+oral+radiology

COMMUNITY & PREVENTIVE DENTISTRY							
CO DE	SPECIFIC LEARNING OUTCOMES	TOPIC	Cognitive	Attitude	MIT	AT	Video Links
ALC-CD001	Define and explain the key periodontal indices used in epidemiological studies (Gingival Index, Plaque Index, OHI-S, CPI, CPITN).	Periodontal Indices	C2	A2	LGIS/SGD	MCQS	https://www.youtube.com/results?search_query=Periodontal+indices+Gingival+Index+Plaque+Index+OHI-S+CPI+CPITN+community+dentistry
ALC-CD002	Differentiate between various periodontal conditions based on pathophysiology and clinical signs.	Periodontal Conditions	C4	A3	LGIS/SGD	MCQS	https://www.youtube.com/results?search_query=Gingivitis+vs+Periodontitis+classification+clinical+features+pathophysiology+periodontology
ALC-CD003	Describe the stages and progression of gingivitis and periodontitis.	Disease Progression	C2	A3	LGIS/SGD	MCQS	https://www.youtube.com/results?search_query=Stages+of+gingivitis+progression+to+periodontitis+periodontology
ALC-CD004	Explain the principles and methodology for measuring gingivitis and periodontitis; interpret findings using standard indices.	Measurement Methods in Periodontal Health	C4	A3	LGIS/SGD	MCQS	https://www.youtube.com/results?search_query=Measuring+gingivitis+and+periodontitis+periodontal+indices+GI+PI+CPI+CPITN+OHI-S+community+dentistry
ALC-CD005	Perform and interpret the Community Periodontal Index of Treatment Needs (CPITN) to assess periodontal status and identify treatment needs.	CPITN and Treatment Needs Assessment	C3	A3	LGIS/SGD	MCQS	https://www.youtube.com/results?search_query=Community+Periodontal+Index+CPITN+WHO+examination+scoring+interpretation+community+dentistry
ALC-CD006	Conduct dietary history for caries risk assessment and demonstrate use of indices (Gingival Index, Plaque Index,	Oral Health Assessment	C3	A3	LGIS/SGD	MCQS	https://www.youtube.com/results?search_query=Dietary+history+caries+risk+assessment

COMMUNITY & PREVENTIVE DENTISTRY							
CO DE	SPECIFIC LEARNING OUTCOMES	TOPIC	Cog niti ve	Attitude	MIT	AT	Video Links
	CPI, CAL) in oral health surveys.	t and Risk Evaluation					ment+Gingival+Index+Plaque+Index+CPI+CAL+community+dentistry

PRACTICALS / LAB WORK

PATHOLOGY & MICROBIOLOGY — PRACTICAL							
CODE	SPECIFIC LEARNING OUTCOMES	TOPIC	Cognitive	Psychomotor	Attitude	MIT	AT
ALC- Pa011	Identify histological slides of acute, chronic & granulomatous inflammation.	Histological Identification	C4	P2	A2	Demonstration	OSPE/OSVE

PERIODONTOLOGY — PRACTICAL							
CODE	SPECIFIC LEARNING OUTCOMES	TOPIC	Cognitive	Psychomotor	Attitude	MIT	AT
ALC-Pe011	Demonstrate plaque removal techniques including proper brushing and flossing.	Brushing and Flossing Techniques	C3	P3	A4	Demonstration	OSPE/OSVE

DENTAL RADIOLOGY — PRACTICAL							
CODE	SPECIFIC LEARNING OUTCOMES	TOPIC	Cognitive	Psychomotor	Attitude	MIT	AT
ALC-DR003	Identify normal periodontal structures on radiographs (OPG and periapical).	Normal Periodontal Structures on Radiographs	C4	P2	A3	Demonstration	OSPE/OSVE
ALC-DR004	Observe alveolar bone and assess bone levels.	Alveolar Bone Observation and Level Assessment	C4	P2	A3	Demonstration	OSPE/OSVE
ALC-DR005	Identify the periodontal ligament (PDL) space on radiographs.	Periodontal Ligament Space Identification	C4	P2	A3	Demonstration	OSPE/OSVE
ALC-DR006	Identify the lamina dura on radiographs.	Lamina Dura Identification	C4	P2	A3	Demonstration	OSPE/OSVE
ALC-DR007	Recognize the cementoenamel junction (CEJ) on radiographs.	Cementoenamel Junction Recognition	C4	P2	A3	Demonstration	OSPE/OSVE

DENTAL RADIOLOGY — PRACTICAL							
CODE	SPECIFIC LEARNING OUTCOMES	TOPIC	Cognitive	Psychomotor	Attitude	MIT	AT
ALC-DR008	Differentiate between cortical and cancellous bone on radiographs.	Cortical vs. Cancellous Bone Differentiation	C4	P2	A3	Demonstration	OSPE/OSVE

ORAL BIOLOGY — PRACTICAL							
CODE	SPECIFIC LEARNING OUTCOMES	TOPIC	Cognitive	Psychomotor	Attitude	MIT	AT
ALC-OB030	Draw and label the differentiation of cementoblasts from ectomesenchymal cells & the fragmentation of Hertwig's epithelial root sheath.	Cementoblast	C3	P3	A2	Demonstration	OSPE/OSVE
ALC-OB031	Draw and label the types of cemento enamel junction.	CEJ	C3	P3	A2	Demonstration	OSPE/OSVE
ALC-OB032	Draw and label cellular cementum.	Cellular Cementum	C3	P3	A2	Demonstration	OSPE/OSVE
ALC-OB033	Draw and label the alveolar and bundle bone.	Alveolar & Bundle Bone	C3	P3	A2	Demonstration	OSPE/OSVE
ALC-OB034	Draw and label the periodontal ligament in a cross-section between teeth.	PDL Cross-Section	C3	P3	A2	Demonstration	OSPE/OSVE

ORAL BIOLOGY — PRACTICAL							
CODE	SPECIFIC LEARNING OUTCOMES	TOPIC	Cognitive	Psychomotor	Attitude	MIT	AT
ALC-OB035	Draw and label the arrangement of principal fiber group within the periodontium.	Principal Fibers Group of PDL	C3	P3	A2	Demonstration	OSPE/OSVE
ALC-OB036	Draw and label the gingival group of fibers (gingival ligament).	Gingival Group of Fibers	C3	P3	A2	Demonstration	OSPE/OSVE
ALC-OB037	Draw and label different anatomical zones of gingiva; mucocutaneous junction, mucogingival junction, & dentogingival junction.	Gingiva & its Junctions	C3	P3	A2	Demonstration	OSPE/OSVE



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OF DENTISTRY



PROFESSIONALISM	
Year	Learning Outcomes (LOs)
I	- Recognize attributes of professionalism (respect, integrity, accountability) - Define professionalism in dentistry - Identify unprofessional behaviors - Practice patient-centered communication (role play) - Apply basic reflective practice

RESEARCH	
Year	Learning Outcomes (LOs)
I	Understand fundamentals of academic writing i.e., official applications, letters, report writing, etc. - Define research, inquiry, and evidence-based dentistry - Recognize importance of research in dentistry - Identify forms of scientific writing (editorial, article, review, case report, meta-analysis) - Explain IMRAD structure - Differentiate types of health research (basic, clinical, applied, public health) - Enlist differences between quantitative and qualitative research - Describe basic principles of research ethics

INFORMATICS	
Year	Learning Outcomes (LOs)
I	- Practice email etiquette & online communication norms (WhatsApp/Social Media Platforms) - Use Word/Google Docs for academic writing basics



- | | |
|--|--|
| | <ul style="list-style-type: none">• Apply safe internet use, recognize credible vs. unreliable sources |
|--|--|

SOCIAL RESPONSIBILITY, CULTURAL SENSITIVITY, ETHICS & JURISPRUDENCE	
Year	Learning Objectives
I	- Define social responsibility in dentistry - Describe role of dentist in public health promotion - Identify cultural diversity in Pakistan - Explain principles of ethics (autonomy, beneficence, non-maleficence, justice) - Take a proper dental consent prior to treatment

MANAGEMENT & ENTREPRENEURSHIP	
Year	Learning Objectives
I	- Describe the concept of teamwork and its relevance in dental practice. - Observe and explain basic workflow (hierarchy) in academic and lab settings. - Identify and apply simple time management strategies for balancing academic and personal tasks. - Explain and apply 7Cs of communication - Demonstrate responsibility in small assigned academic or group-based tasks.

EVIDENCE BASED DENTISTRY	
Year	Learning Objectives
I	- Define Evidence-Based Dentistry. - Explain the significance of EBD in clinical decision-making. - Identify the components of EBD: best available evidence, clinical expertise, and patient preferences.



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C-FRC

Clinical Foundation
Rotation Clerkships



Block II	
1.	Infection Control and Waste Management Demonstrate safe handling and disposal of sharps and dental waste.
2.	Communication Skills Demonstrate counseling skills related to caries prevention.
3.	Temperature Recording Measure body temperature using a mercury/digital thermometer



RAHBAR COLLEGE
OF DENTISTRY

The Holy Quran



DEPARTMENT OF DENTAL EDUCATION

Holy Quran Module Overview

MODULE RATIONALE	
The Holy Quran provides wisdom and knowledge to be followed in every applied component of modern civilization covering Ethical, Social, Legal, Financial and Healthcare Domains. The complete Quran encompasses the guidelines, all full of 'Hikmah' (wisdom) to deal with all practical scenarios encountering patients and health professionals. As the Holy Quran is the guiding light for humanity and a way of life for all the believers of one true Allah, therefore, understanding the message of this Holy Book is mandatory for realizing the duties which one has towards other human beings in general and the profession in particular. Holy Quran is a guide for the modern society and scientific development therefore, orbiting around Quranic doctrines and axioms of Hadith, all challenges faced by modern healthcare can be solved. Therefore, this longitudinal curriculum is developed so that all health professionals can get, as enunciated by the Holy Quran itself, "the best of this world as well as the best of the Hereafter".	
VISION & MISSION	
2.1: Vision	Building the personality and character of health professionals in light of teachings of the Holy Quran and Sunnah, to alleviate human sufferings.
2.2: Mission	Teaching Holy Quran and Sunnah to undergraduate students of Health Sciences, building their personality and character, enabling them to apply these principles in patient care and innovative research.
CURRICULUM DESIGN AND ORGANIZATION	
3.1: Course Aim	The Holy Quran course aims to imbibe Health profession students with professionalism, general and medical, based on Divine teachings. The professionals thus groomed shall be able to correlate religion with healthcare delivery and modern science with an understanding that evidence-based practice itself originated from the system by which the 'Hadith' was preserved after centuries.
3.2: Mode of Delivery	The module will be taught in the form of interactive lectures.
3.3: Learning Experience	Classroom environment will be used.

3.4: Attendance	Eighty five percent (85%) attendance is mandatory to be eligible to sit in the professional examination.
3.5: Course Modules	The curriculum will be taught under three Major Sections: • Faith • Worship • Specific Quranic Commandments
3.6: Module Credit Hours & Contact Hours	This will be a three (03) credit hour course where each credit hour will be equivalent to eighteen (18) contact hours.
3.7: Assessment Portfolio	The assessment will be done through student portfolios based on four written assignments and two quizzes per year. The portfolio submission to the Quran teacher will be mandatory for sending admission to the university and sitting in the professional examination. The assignments will be based on the topics discussed during the year.
3.8: Reference Material	• Translations of the Holy Quran approved by the Quran Board • Six Authentic Books of Hadith
3.9: Module Faculty	At least one full time faculty member (Lecturer or above) will be hired for running the Holy Quran course throughout the year. The qualifications of the faculty member will be certified by the academic council of the college/institution to be declared as the teacher of Holy Quran course.



SECTION ONE: FAITH (AQAIID)

LEARNING OUTCOMES

a. Oneness of Allah (SWT) (Tawheed)

- i. Describe Unity of Allah in being
- ii. Describe Unity of Allah in attributes
- iii. Describe concept of Shirk
- iv. Impact of Tawheed in human life

b. Prophethood (Risalat)

- i. Explain Significance of Risalat
- ii. Identify Prophets as role models
- iii. Recognize finality of Prophethood - Prophet Muhammad (PBUH)

c. Belief in Hereafter (Aakhirat)

- i. Appraise continuity of life beyond material world
- ii. Concept of Doomsday and its various stages
- iii. Concept of Day of Judgment and accountability in the Hereafter
- iv. Concept of "Meezan"

d. Divine Revelations (Holy Books)

- i. Explain the divine decree in sending the Holy Books
- ii. Identify the Holy Quran as the only preserved & authenticated divine revelation to date
- iii. Interpret Quran as Furqan

e. Angels

- i. Discuss belief in angels and its significance
- ii. Describe the universal role of angels (their specific duties)

f. Qadr

- i. Identify Taqdeer as Knowledge of Allah

Explain the concept of Faith in Good and Evil

CONTENTS

1. Oneness of Allah subhan wa taala (Tawheed)

2. Prophethood (Risalat)
3. Belief in Hereafter (Akhirat)
4. Devine revelations (Holy Books)

SECTION TWO: WORSHIP (IBADAAT)

LEARNING OUTCOMES

a. Prayer (Namaz)

- i. Recognize the importance of physical purity (Taharah)
- ii. Discuss the philosophy of prayer and its role in purification of soul
- iii. Recognize the importance of prayer in building personal character - sense of duty, patience, perseverance, punctuality and self/social discipline
- iv. Spiritual, moral and social impact of prayer in building of righteous community
- v. Role in creating brotherhood, equality and unity in ummah
- vi. Identify the conditions in which relaxation in prayer is allowed e.g. during operation, travelling etc.

b. Obligatory Charity (Zakat)

- i. Identify obligatory importance of Zakat and other items as outlined under the title of 'Infaq-fee-sabilillah'
- ii. Categorize the people who can be the beneficiaries of Zakat
- iii. Role of zakat in eradication of greed and love of material world
- iv. Effect of Zakat and sadaqat in circulation of wealth and alleviation of poverty
- v. Explain the essence of zakat and sadaqat in building just communities
- vi. Describe the role of state in collection and disbursement of zakat

c. Fasting (Roza)

- i. Discuss the importance and significance of fasting
- ii. Relate the Holy Quran and the month of Ramadan
- iii. Role of fasting in building personal qualities like self-control, piety and soft

corner for the poor and needy persons

iv. Identify the applications of “Taqwa” through fasting

d. Pilgrimage (Hajj)

i. Discuss the importance and significance of Hajj

ii. Identify the conditions in which Hajj becomes an obligation

iii. Role of manasik-e-Hajj in producing discipline and complete submission

iv. Recognize the importance of Hajj in uniting the ummah

Sacrifice for Allah subhan wa taala (essence of qurbani)

TOPIC AREAS

1. Prayer (Salah/Namaz)
2. Obligatory charity (Zakat)
3. Fasting (Saum/Roza)
4. Pilgrimage (Hajj)

SECTION THREE: SPECIFIC QURANIC COMMANDMENTS

LEARNING OUTCOMES

a. Importance of the protection of Human life

- i. Concept of the sanctity of human life in Quran and Sunnah
- ii. Importance and significance of a single human being even during war
- iii. Concept of punishment in regard to the killing of a human being, voluntarily or involuntarily

b. Jihad

- i. Concept of Jihad and its significance (hikmat)
- ii. Different forms of Jihad and their importance
- iii. Principles and preparation of Jihad
- iv. Divine reward of Jihad

c. Heirship/Inheritance (Virasat)

- i. Heirship and division of wealth in accordance with divine teachings
- ii. Heirs and their shares
- iii. Legal aspect of virasat (Hud-e-Illahi)

d. Amar-bil-marooif-wa-Nahi-anil-munkar

- i. Differentiation between Marooif and Munkar
- ii. Importance and significance (effects of avoiding this principle)
- iii. Necessary conditions of both amar-bil-marooif and nahi-anil-munkar
- iv. The different stages and the necessary prerequisites

e. Hadood-e Illahee and taazeerat

- i. Meaning and various types of hadood-e-Illahee
- ii. Authority for fixation of limit (hudd)
- iii. Criteria and permissible relaxation in fixing the limits
- iv. Difference between 'Hadood', 'Qisas' and 'Tazeerat'. Punishments which are left to the court of law
- v. Benefits for the good of community

f. Justice (Adal-o-insaf)

- i. Justice of Allah subhan wa taala
- ii. Importance of justice for the survival of community
- iii. Need of justice to be prevailed irrespective of religion
- iv. Devine reward for fair justice

g. Business (Bay-o-tijarat)

- i. Importance of fair business and its necessary constituents
- ii. Permissible and impermissible conditions of businesses

iii. Concept of loan in businesses

h. Interest (Riba or Sudi karobar)

- i. Meaning of Riba or interest and its different forms
- ii. Impact of Riba on a society in general
- iii. Devine declaration and its punishment both in this world and Hereafter

i. Nikah-o-talaq

- i. Basic rulings regarding marriage and divorce
- ii. Importance of Nikah and its constituents
- iii. Conditions of Nikah and various forms of prohibited/impermissible nikah
- iv. Misconception of dowry
- v. Talaq and its various forms

Meaning of Khula and its conditions

CONTENTS

1. Importance of the protection of Human life
2. Jihad
3. Heirship/Inheritance (Virasat)
4. Amar-bil-marooof-wa-Nahi-anil-munkar
5. Haddood-e Illahee and taazeerat
6. Justice (Adal-o-insaf)
7. Business (Bay-o-tijarat)
8. Interest (Riba or Sudi karobar)
9. Nikah-o-talaq



RAHBAR COLLEGE
OF DENTISTRY

Islamiyat & Pakistan Studies



DEPARTMENT OF DENTAL EDUCATION

MODULE RATIONALE

This module comprises of Islamiyat & Pakistan Studies. All the medical or other curricula relate to our core context and internal fiber. The study of religion and country endorses all relevancy and competency acquisition for the purpose of service to humanity and community orientation.

ISLAMIYAT

A short course on Islamic Studies will be completed in First year with an exam at the end of the year.

Course Content: 1. Understand the basic principles of Islam.

2. Explain the concept of the Islamic state.

3. Explain the Quran as a guide for modern society and scientific development.

4. Describe the life of the Holy Prophet Peace be upon him as an example to follow.

5. Explain ethics in the Islamic prospective.

6. Describe the rights of the individual in Islam.

7. Describe the rights of women and children in Islam.

8. Explain the contribution of Islamic scholars to science and medicine.

9. Understand Islam in terms of modern scientific development.

10. Explain the concept of Rizk-e-Hilal.

11. Explain the concept of Hukook-ul-Ibad.

PAKISTAN STUDIES

A short course on Pakistan Studies will be completed in First year with an exam at the end of the year.
Course Content:

1. Describe brief the salient features of the Pakistan movement.

2. Explain the basis for the creation of Pakistan.

3. Give a brief account of the history of Pakistan.

4. Explain the ethnic and cultural distribution of the population of Pakistan.

5. Describe the Provinces and resources available in Pakistan.

6. Explain current problems faced by Pakistan.

7. Describe the social, economic and health problems of the rural population of Pakistan.



ISLAMIYAT AND PAKISTAN STUDIES BOOKS

- Standard Islamiyat (Compulsory) for B.A, B.Sc., M.A, M.Sc., MBBS by Prof. M.Sharif Islahi Ilmi Islamiyat (Compulsory) for B.A. B.Sc., & equivalent.
- Pakistan studies (Compulsory) for B.A. B.Sc., B.Com., Medical/Engineering by Prof. Shah Jahan Kahlun
- Pakistan studies (Compulsory) for B.A, B.Sc., B.Com., B.Ed., Medical/Engineering by Prof. Shah Jahan Kahlun



RAHBAR COLLEGE
OF DENTISTRY

CIVICS



DEPARTMENT OF DENTAL EDUCATION

MODULE RATIONALE

Civics is part and parcel of life and the study of Civics has major thrust on improvement of the quality of life and welfare of human beings. This discipline enhances the approach towards rational behavior and daily life.

There is a need for us to know role of a citizen with specific reference to Global Village, the Citizen and Daily life issues, Citizenship, Rights and Responsibility, Role of Government and State, Implementation Issues of Devolution plan, Social Welfare Institutions/ NGOs and their role at basic level, social interactions and the new discoveries in IT and mass media, relations with International Organizations and Pakistan and its neighbors. Civics goes beyond the cognitive level to deal with social values and attitudes. From the earliest stages of the course, it is important to respect students' opinions while helping them to develop a rationale for their opinions. This curriculum is adapted from Agha Khan University Examination Board curriculum for higher secondary examination.

2. VISION & MISSION

2.1: Vision: Building the personality and character of health professionals

2.2: Mission: Teaching Civics to undergraduate students of Health Sciences, building their personality and character, enabling them to apply these principles in patient care.

3. CURRICULUM DESIGN AND ORGANIZATION

3.1: Course Aim:

- To develop understanding of the social nature and significance of civics, its key concepts and civic life.
- To emphasize learning of related themes in a way that encourages creativity, curiosity, observation, exploration and questioning.
- To create awareness of the nature of civic life and the relationship between civics and other social sciences.
- To promote understanding about the ideology of Pakistan and the struggle of an independent state.
- To inculcate the behavior patterns of national character, and qualities of a good citizen, self-reliance, patriotism and leadership.
- To create a strong sense of national unity, integration and cohesion.
- To prepare students as future citizens, conscious of their positive role in a society and the world at large.

3.2: Mode of Delivery: The module will be taught in the form of interactive lectures. 3.3: Learning Experience: Classroom environment will be used.

3.4: Attendance: Seventy-five percent (75%) attendance is mandatory to be eligible to sit in the professional examination.

3.5: Assessment: The assessment will be done through two written assignments and two quizzes per year. The assignments will be based on the topics discussed during the year.

3.7: Module Faculty: At least one full time faculty member (Lecturer or above) will be hired to run the civics course throughout the year. The qualifications of the faculty member will be certified by the academic council of the college/institution to be declared as the teacher of civics.

LEARNING OUTCOMES	TOPICS
i. Define civics ii. Describe how civics can improve the citizenship iii. Illustrate the scope of civics iv. Discuss the nature of civics v. Give examples how civics can help in the national development	Civics-Meaning & Nature
i. Examine the significance of civics ii. Explain how civics is important to know the problems of daily life iii. Discuss how civics can help to bring improvements in the civics life of citizens iv. Evaluate how civics can improve the sense of love and respect for human relationship v. Discuss that studying civics can develop a sense of gratitude vi. Give examples how civics is important to develop the global unity	Significance and Utility
i. Compare civics with political science, history, economics, sociology	Relationship with Social Sciences

and ethics	
i. Describe the term harmonic relationship ii. Explain the harmonic relationship among different members of society. (Women, children and senior citizens) iii. Explain how harmonic relationship develop for respect of religion	Harmonic Relationship
i. Define the term individual in relation to civics ii. Define the term state iii. Explain the relation between an individual and a state iv. Describe the importance of an individual in a state v. Enlist the responsibilities of an individual in a state	Individual and state
i. Identify the basic unit of social institution Discuss and characterize the different types of family ii. Give the importance of basic unit of social institution in the development of a state Enlist the responsibilities of family in general iii. Analyze your role for the betterment of the family Compare and contrast the impact of the deterioration of family in the western society and give examples	Family
i. Define community ii. Explain the nature and significance of community iii. Discuss the role of a family in community iv. Analyze the role of an individual for the betterment of the community	Community

i. Define society ii. Elaborate the relation between an individual and society and society and state iii. Analyze the role of an individual for the betterment of society	Society
i. Define the term nation, nationality and ummah differentiate between nation and nationality distinguish between nation and ummah analyze the value, behavior and the pattern of society based on religions ii. Evaluate the characteristics of society developed by religions	Nation, Nationality
i. Trace the origin of state with reference to the theories of Divine Origin, Force and Social ii. Contract (Hobbs, Lock, Rousseau) iii. Describe the elements of a state (sovereignty, population, territory, Government) iv. Compare and distinguish the role of state, society and government	Origin and elements of State
i. Describe the functions of state ii. Describe the factors which are necessary for proper functioning of state iii. Analyze the situation when a state does not function properly iv. Describe the characteristics of a welfare state Analyze how a welfare state guarantees the equity and justice on the issues of gender,	Functions of state. (Defense, law and order, welfare etc.)

religion, and social classes	
i. Define the concept of sovereignty in west ii. Discuss different kinds of sovereignty iii. Explain Austin's concept of sovereignty iv. Analyze critically Austin's concept of sovereignty	Sovereignty



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Teaching Methodologies



TEACHING METHODOLOGIES & INSTRUCTIONAL STRATEGIES

Delivery of the BDS Integrated Curriculum 2k25 Version 2.0 requires a diversity of instructional strategies to accommodate different learning styles and to develop cognitive, psychomotor, and affective competencies. In accordance with UHS guidelines, at least three different methods of instruction must be adopted in each Block. The following strategies are recommended and utilised in Block 2.

METHOD OF INSTRUCTION (MIT) — ABBREVIATION KEY	
Abbreviation	Full Form
LGIS	Large Group Interactive Session
SGD	Small Group Discussion
TBL	Team-Based Learning
PBL	Problem-Based Learning
SDL	Self-Directed Learning
CFRC	Clinical Foundation Rotation Clerkship
Demonstration	Laboratory / Clinical Demonstration
Tutorial	Structured Small-Group Tutorial

INSTRUCTIONAL METHOD DESCRIPTIONS

1. Large Group Interactive Session (LGIS)	
Description	LGIS is the primary delivery format for theoretical content in BDS Year 1. Each session runs 50 minutes with an average active attention span of 20–30 minutes, requiring embedded interactive breaks. Sessions incorporate two-way interaction between presenter and students through brainstorming, buzz groups, simulation, case vignettes and targeted questioning. All theory LOs mapped to LGIS/SGD are delivered in this format.

Significance	+ Efficient delivery of large volumes of content to an entire cohort simultaneously + Promotes active involvement through brainstorming and case-based questions + Builds independent thinking and group communication skills + Cost-effective; uses available audiovisual technology + Establishes shared knowledge base before SGD or lab sessions
Facilitator Tips	→ <i>Begin each session with a 2-minute review of previous content</i> → <i>Use 1-minute think-pair-share every 20 minutes to maintain attention</i> → <i>End with exit tickets — one thing learned, one question remaining</i> → <i>Display Bloom's level of each LO at the start of the slide deck</i>

2. Small Group Discussion (SGD)	
Description	SGD runs concurrently with LGIS as the primary method for LOs coded LGIS/SGD. Groups of 8–12 students discuss pre-assigned trigger questions, clinical vignettes or problem statements under faculty facilitation. SGD is especially used for pharmacology drug-selection scenarios, pathology case discussions and periodontal disease classification exercises in Block 2.
Significance	+ Develops higher-order thinking: analysis, synthesis and evaluation + Encourages peer-to-peer learning and collaborative reasoning + Allows misconceptions to be identified and corrected promptly + Deepens clinical reasoning through case-based discussion + Builds communication and professional skills essential for dentistry
Facilitator Tips	→ <i>Distribute trigger questions 48 hours before the session for preparation</i> → <i>Facilitate, do not lecture — use Socratic questioning</i> → <i>Rotate discussion leadership among students each session</i> → <i>Close with a structured summary linking SGD to LOs and assessment</i>

3. Team-Based Learning (TBL)

Description	TBL is a structured form of cooperative learning involving four core elements: forming permanent teams of 5–7 students, individual readiness assurance tests (iRAT), team readiness assurance tests (tRAT), team application exercises, and facilitated reporting. In Block 2, TBL is used for Neurosciences sessions on ascending/descending tracts, pharmacodynamics and periodontal disease progression.
Significance	+ Students demonstrate deeper engagement than in traditional lectures + Immediate feedback through iRAT/tRAT identifies knowledge gaps + Teams consistently outperform their best individual members + Students perform better in standardised exams (MCQs, OSPEs) + Develops teamwork and leadership skills essential for clinical settings
Facilitator Tips	→ <i>Ensure teams are formed before the first TBL session with pre-reading assigned</i> → <i>iRAT: 10 questions, 10 minutes; tRAT: same questions, scratch-card format</i> → <i>Application exercises must be clinically relevant to dentistry</i> → <i>Award team points; display leaderboard to motivate participation</i>

4. Problem-Based Learning (PBL)	
Description	PBL is a student-centred approach where small groups (7–10) work through a structured clinical problem across multiple sessions. Students define their own learning objectives, self-study, then reconvene to apply knowledge to the problem. In Block 2, PBL triggers include: "A patient presents with tooth sensitivity and radiographic periapical changes" (Foundation-2), "A dental patient develops facial nerve palsy post-extraction" (Craniofacial-2) and "A 45-year-old patient presents with generalised periodontal bone loss" (Module 7).
Significance	+ Promotes self-directed and lifelong learning skills + Integrates knowledge across multiple disciplines simultaneously + Develops critical thinking and evidence appraisal skills + Improves clinical reasoning through authentic problem contexts + Fosters leadership, respect for colleagues' views and presentation skills
Facilitator Tips	→ <i>Tutors must be trained facilitators, not content experts during PBL</i> → <i>Each trigger should map to multiple LOs across at least two subjects</i>

	→ Provide a structured problem template with defined opening and closing sessions → Assess individual and group contributions separately
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5. Laboratory Practical / Lab Work	
Description	Laboratory practicals in Block 2 cover histology slide identification, Gram staining and microbial techniques, drug dose calculations, dental radiograph interpretation, and drawing/labelling of histological structures. Each session begins with a faculty demonstration followed by independent student practice. Assessment is through OSPE/OSVE stations. Lab LOs are coded with Psychomotor levels P2 (guided response) or P3 (mechanism/precision).
Significance	+ Develops essential psychomotor and observational skills for clinical dentistry + Provides a risk-free environment to practice skills before clinical contact + Reinforces theoretical concepts through direct visual and tactile experience + Develops scientific reasoning and methodical laboratory habits + Direct preparation for OSPE stations in Block examinations
Facilitator Tips	→ Provide pre-lab worksheets with expected observations and diagrams → Demonstrate each technique twice before students attempt independently → Circulate continuously; check Gram stains and diagrams before students submit → Use formative spot-checks: display sample slides and ask students to identify

6. Demonstrations	
Description	The demonstration method involves a faculty member performing a specific clinical or laboratory skill systematically while explaining each step. In Block 2 demonstrations include: sterilization and disinfection of dental instruments, plaque removal and oral hygiene techniques, cranial nerve examination procedures, cadaveric neuroanatomy identification, and radiograph interpretation. Demonstrations precede all practical sessions and are assessed at OSPE/OSVE stations.
Significance	+ Provides a visual and step-by-step model for skill acquisition + Correlates theoretical knowledge with practical application

	+ Sharpens observation skills critical for clinical competency + Sustains interest and motivation in practical sessions + Provides a benchmark for student self-assessment
Facilitator Tips	→ Narrate each step clearly; repeat critical steps a second time in silence → Allow students to ask clarification questions immediately after demonstration → Record demonstrations as short videos for student revision access → Use check-off lists during demonstration to guide student observation

7. Tutorial	
Description	Tutorials are structured small-group sessions (10–15 students) where a faculty tutor provides intensive guided instruction on a focused topic. Tutorials differ from SGD in that the tutor plays a more directive role. In Block 2, tutorials are used for biochemistry pathways (heme synthesis, RBC metabolism), pharmacokinetics calculations, and neuroanatomy tract tracing. Students submit pre-tutorial self-study questions and tutors provide targeted feedback.
Significance	+ Identifies and corrects individual misconceptions that persist after lectures + Allows personalised academic support and immediate formative feedback + Develops problem-solving skills and practice of self-directed learning + Reduces time to understand complex topics such as pharmacokinetics + Builds confidence in preparation for block examinations
Facilitator Tips	→ Distribute self-study questions one week in advance → Begin with brief MCQ quiz (5 questions) to gauge prior knowledge → Focus tutorial time on areas where most students struggled → End with "muddiest point" card for anonymous feedback to faculty

8. Reflective Writing

Description	Reflective writing is a metacognitive strategy where students articulate their learning process, identify gaps and plan improvements. In Block 2, reflective writing is integrated within PRISME (Professionalism domain) and Neurosciences sessions. Students submit reflective journals after clinical exposure (CFRC), significant learning events or ethical dilemmas encountered in their studies. Structured reflection frameworks such as Gibbs' Reflective Cycle are used.
Significance	+ Develops critical self-awareness and metacognitive skills + Promotes identification of areas for personal improvement + Builds professional identity and ethical reasoning in dental students + Strengthens response to new clinical and academic challenges + Enhances written communication skills essential for professional practice
Facilitator Tips	→ Introduce a structured reflection framework (e.g. Gibbs, DEAL) in orientation → Provide a reflective writing template with guided prompts → Provide formative written feedback; do not grade solely on style → Share anonymised exemplary reflections to model good practice

9. Self-Directed Learning (SDL)	
Description	SDL is a foundational competency for lifelong professional learning. In Block 2, SDL time is built into the weekly timetable (Friday Integrated Session). Students are provided with learning objectives, recommended resources and self-assessment questions to guide independent study. SDL prepares students for LOs that will be assessed in block examinations and supports deeper engagement with complex topics across all four modules.
Significance	+ Cultivates habits of lifelong learning essential for dental professionals + Allows students to personalise their learning pace and depth + Reinforces prior LGIS content and prepares for SGD/TBL/PBL sessions + Develops information literacy: locating, evaluating and applying evidence + Encourages use of digital learning resources and online databases
Facilitator Tips	→ Provide a curated SDL resource list aligned to each week's LOs → Set 2–3 self-assessment MCQs per SDL week for formative practice

	→ Incorporate SDL-based questions in block examination papers → Encourage use of Anki, Khan Academy Health, PubMed and UHS e-library
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10. Clinical Foundation Rotation Clerkship (CFRC)	
Description	CFRC provides first-year BDS students with structured early clinical exposure in a supervised, observation-based format. In Block 2, CFRC activities include: infection control and waste management, counselling for caries prevention and temperature recording. Students observe dental procedures, interact with patients under supervision and complete structured observation forms. CFRC is assessed through OSCE stations (9 marks) in the Block examination.
Significance	+ Bridges the gap between basic sciences and clinical dentistry from Year 1 + Develops patient communication, professionalism and clinical empathy + Contextualises theoretical knowledge within the clinical environment + Builds confidence for transition to clinical clerkships in later years + Provides early exposure to infection control and safe clinical practice
Facilitator Tips	→ Brief students comprehensively on observation objectives before each rotation → Pair each student with a clinical supervisor for each CFRC session → Require students to complete structured observation forms after each session → Debrief as a group after CFRC; link observations to relevant Block 2 Los



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Assessment



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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 Attendance	Clerkship	Remedial Classes
<75%, ≥ 50% (50-74%)		i. Principal of the college may conduct remedial classes and submit result to the Examination Department, UHS, independently. ii. 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%		
<50%		i. 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. ii. 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. iii. 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
<50% Marks/ Absence from Block /Clinical Clerkship Examination	i. 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

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.

BDS 1 st Year, BLOCK-02							
Sr. No.	Written Exam		Oral/Practical exam				Total
	Subjects	No. of MCQs	Subjects	OSPE (9 marks)	OSCE/ CFRC (9 marks)	OSVE (6 marks)	
1	Anatomy	23	Anatomy	01	-	01	15
2	Oral Biology	20	Oral Biology	03	-	01	33
3	Biochemistry	19	Biochemistry	-	-	01	06
4	General Pathology & Microbiology	14	General Pathology & Microbiology	01	-	01	15
5	Physiology	18	Physiology	-	01	01	15
6	Oral Pathology	7	Oral Pathology/ Periodontology	01	-	01	15
7	Community Dentistry	4	Community Dentistry /Dental Radiology	01	-	01	15
8	Periodontology/ Dental Radiology	4	Pharmacology	-	-	01	06
9	Pharmacology	7	-	-	-	-	-
10	Dental Radiology	4	-	-	-	-	-
Total		120	Total	7 OSPE= 63 marks	1 OSCE/ CFRC =	8 OSVE= 48 marks	120



				09 marks		
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Learning Resources





Subject	Learning Resources
General Anatomy, Histology & Embryology	1. Junqueira's Basic Histology: Text and Atlas (17th ed.) 2. Wheater's Functional Histology 3. Siddiqui, L. H. Medical Histology: Text and Atlas 4. General Anatomy by Laiq Hussain Siddiqui 5. Langman's Medical Embryology (15th ed.) 6. The Developing Human (10th ed.) by Moore et al.
Physiology	1. Guyton & Hall. Textbook of Medical Physiology (14th ed.).
Biochemistry	1. Harper's Illustrated Biochemistry (32nd ed.) by Rodwell et al. 2. Lippincott Illustrated Reviews: Biochemistry (8th ed.) by Abali et al.
Oral Biology & Tooth Morphology	1. Nanci, A. (2024). Ten Cate's Oral Histology, Development, Structure, and Function (10th ed.). Elsevier Health Sciences. 2. Berkovitz, B. K., Holland, G. R., & Moxham, B. J. (2017). Oral Anatomy, Histology, and Embryology (5th ed.). Elsevier Health Sciences. 3. Kumar, G. S. (2023). Orban's Oral Histology & Embryology (13th ed.). Elsevier Health Sciences. - Fuller, J. L. (4th ed.). Concise Dental Anatomy & Morphology. 4. Nelson, S. J. (2015). Wheeler's Dental Anatomy, Physiology and Occlusion (1st SAE).

	5. Woelfel's Dental Anatomy (Jones & Bartlett Learning)
Pathology & Microbiology	1. Robbins & Cotran Pathologic Basis of Disease 2. Review of Medical Microbiology and Immunology by Levinson 3. Textbook of Pathology by Walter & Israel
Community & Preventive Dentistry	1. Textbook of Preventive and Community Dentistry by S.S. Hiremath 2. Community Oral Health by Cynthia Pine & Rebecca Harris

Pharmacology & Therapeutics	1. Katzung & Trevor's Pharmacology Examination & Board Review (12th ed.) 2. Lippincott Illustrated Reviews: Pharmacology (7th ed.)
Oral Pathology	1. Contemporary Oral and Maxillofacial Pathology by Wysocki, Sapp & Eversole 2. Cawson's Essentials of Oral Pathology & Oral Medicine
Operative Dentistry	1. Sturdevant's Art and Science of Operative Dentistry 2. Summitt's Fundamentals of Operative Dentistry 3. Dental Caries: The Disease and Its Clinical Management by Fejerskov & Kidd
Psychiatry & Behavioral Sciences	1. Hand book of Behavioral sciences, by MH Rana, 3rd ed. 2. Humayun A., Herbert M. (2010). Integrating behavioral sciences in healthcare. Islamabad: HEC.
Periodontology	1. Newman and Carranza's Clinical Periodontology (3rd South Asia Edition)
Prosthodontics	1. McCracken's Removable Partial Prosthodontics (13th Edition) 2. Boucher's Prosthodontic Treatment for Edentulous Patients (12th Edition)
Orthodontics	1. Proffit's Contemporary Orthodontics (6th Edition)
Science of Dental Materials	1. Philips Science of Dental Materials (12th Edition) 2. McCabe Applied Dental Materials (15th Edition)
Oral Medicine	1. Tyldesley's Oral Medicine (5th Edition)