



BDS

INTEGRATED CURRICULUM

2k25 Version 2.0

2nd Year BDS Session 25-26

Block-5 Study Guide

Module 15	Module 16	Module 17	Module 18
Endocrinology	Occlusion II	Community Dentistry and Public Health II	Dental Materials and Pre-clinical Dentistry II



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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-2

Modules

Block-4

1. Cariology-II
2. Community Dentistry & Public Health-I
3. Dental Materials & Pre-Clinical Dentistry-I
4. Hepatorenal

Block-5

1. Endocrinology
2. Occlusion -II
3. Community Dentistry & Public Health-II
4. Dental Materials & Pre-Clinical Dentistry-II

Block-6

1. Craniofacial-III
2. Respiration
3. Dental Materials & Pre-Clinical

PRISME Year 2

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

CFRC Year 2

Clinical Foundation Rotation Clerkships

PRINCIPAL MESSAGE



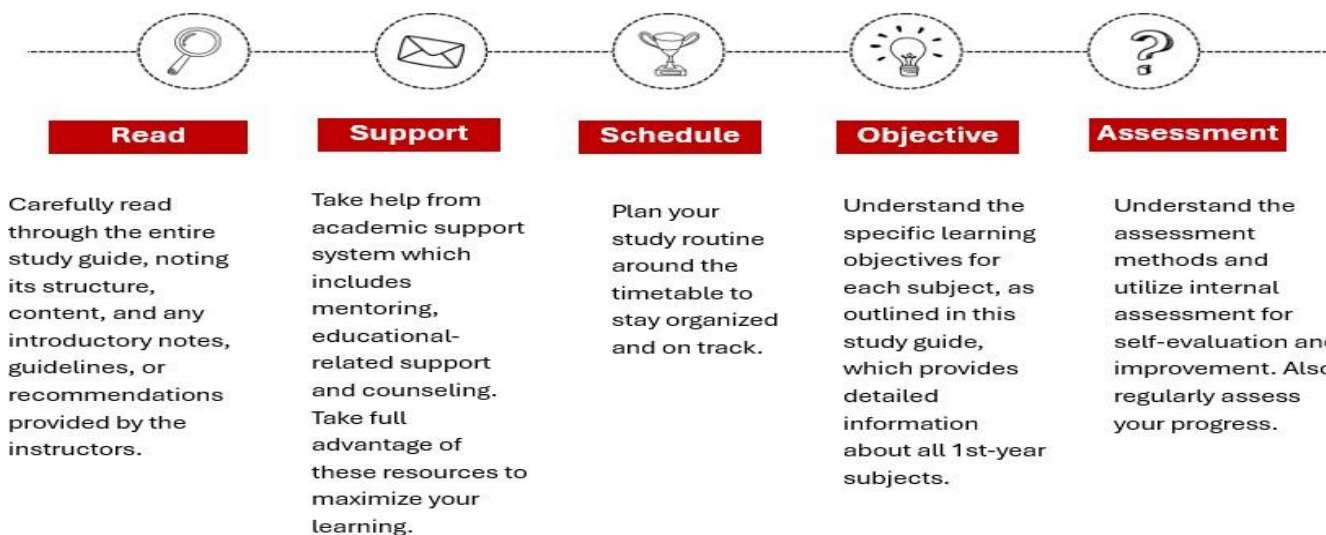
At RCoD, our mission is to create a supportive and innovative learning environment where students can excel academically, professionally, and personally. Through rigorous academic programs, hands-on clinical experiences, and opportunities for cutting-edge research, we empower our students to become compassionate 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-5

Block-5 Start Date	31 st August 2026
Block-5 Exam	30 th November – 4 th December 2026
Block-5 Ends Date	4 th December 2026

TIME TABLE

Block-5 Time Table Week - 1										
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	CLASS TEST	Community Dentistry Interactive Lecture Code: Topic: Facilitator:	Pharmacology Interactive Lecture Code: Topic: Facilitator:	Orthodontics Interactive Lecture/ Practical Code: Topic: Facilitator:	Physiology Interactive Lecture Code: Topic: Facilitator:	Break	General Pathology Interactive Lecture Code: Topic: Facilitator:	Oral Biology Interactive Lecture Code: Topic: Facilitator:	PRISME Interactive Lecture Code: Topic: Facilitator:	
Monday	CBL Group A Group B	Operative Dentistry Interactive Lecture Code: Topic: Facilitator:	Community Dentistry Interactive Lecture Code: Topic: Facilitator:	Biochemistry Interactive Lecture Code: Topic: Facilitator:	Physiology Interactive Lecture Code: Topic: Facilitator:		OMDS: Periodontology Interactive Lecture Code: Topic: Facilitator:	Behavioural Sciences Interactive Lecture/ SGD Code: Topic: Facilitator:	Behavioural Sciences Interactive Lecture Code: Topic: Facilitator:	
Monday	Dental Materials Interactive Lecture Code: Topic: Facilitator:	Dental Materials Practical Code: Topic: Facilitator:	Pre-Clinical Operative/ Prosthodontics Practical Batch A Code: Topic: Facilitator: Practical Batch B Code: Topic: Facilitator:				Behavioural Sciences Interactive Lecture/practical Code: Topic: Facilitator:	Pharmacology Interactive Lecture Code: Topic: Facilitator:	CBL Group A Group B	
Monday	Community Dentistry Interactive Lecture Code: Topic: Facilitator:	Dental Materials Interactive Lecture Code: Topic: Facilitator:	Pre-Clinical Operative/ Prosthodontics Practical Batch A Code: Topic: Facilitator: Practical Batch B Code: Topic: Facilitator:				CFRC Clinical Foundation Rotation Clerkship Topic: Facilitator:		Research Practical/ Interactive Lect Code: Topic: Facilitator:	
Monday	CLASS TEST	Dental Materials Interactive Lecture/ Practical Code: Topic: Facilitator:	Dental Materials Practical/ Interactive Lecture Code: Topic: Facilitator:	Pharmacology Interactive Lecture Code: Topic: Facilitator:	Prosthodontics Interactive Lecture Code: Topic: Facilitator:		Behavioural Sciences Interactive Lecture/ Practical Code: Topic: Facilitator:	Break	Integrated Session	

Tuesday OFMS/ Periodontology Slot. From week 1 to 4 Periodontology and week 5 onwards OMFS will be taught.

1. Vice President, RCd 2. Director Admin, RCd 3. Co-ordinator Head of Departments, RCd 4. Deputy Director Admin, RCd 5. IT Incharge, RCd 6. Computer Cell, RCd 7. Student Affairs, RCd 8. Notice Board, RCd 9. Bus Service, RCd 10. Class representative (Study Cells), RCd	Prof. Dr. Waseem Zafar Raja Director R&D Cell/ HOD Prosthodontics Rahbar College of Dentistry, Lahore.	Dr. Akhtar Zameer Bilal HOD Biochemistry Rahbar College of Dentistry, Lahore.	Prof. Dr. Bilal Iqbal Aizal (R), TI (M) HOD General path. Rahbar College of Dentistry, Lahore.	Dr. Salma Noor Asst Prof / HOD Dental Education Rahbar College of Dentistry, Lahore.	Prof. Dr. Farhat Jinnah HOD Orthodontics Rahbar College of Dentistry, Lahore.	Prof. Dr. Salma Noor HOD Pharmacology Rahbar College of Dentistry, Lahore.	Prof. Dr. Muhammad Noor Ishtiaq Principal/HOD Operative Dentistry Rahbar College of Dentistry, Lahore.	Prof. Dr. Omar Anjum HOD Dental Materials Rahbar College of Dentistry, Lahore.
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Block Coordinators/ Subject in Charges

Coordinators	
HOD Community Dentistry/ Year Coordinator	Prof Dr. Fahad Mehtab Ud Din Dogar
HOD Dental Education	Dr. Saima Norin
HOD Physiology/ Practical Exam Coordinator	Prof Dr. Saima Rizwan

Block-5 Subject In-charges	
HOD Operative Dentistry/ Principal	Prof. Dr. Muhammad Nasir Saleem
HOD Community Dentistry	Prof Dr. Fahad Mehtab Ud Din Dogar
HOD Oral & Maxillofacial surgery	Prof. Dr. Ashfaq Ur Rahim
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 Orthodontics	Prof. Dr. Farhat Amin
HOD General Pathology	Dr. Maria Noor (Focal Person)
HOD Prosthodontics	Prof Dr. Hina Zafar Raja
HOD Periodontology	Dr. Iftikhar Ahsen
HOD Dental Materials	Prof. Dr. Omair Anjum
PRISME Domain Professionalism, Social Science Domain Research Domain Management & Entrepreneurship Domain Informatics	Dr. Sadia Imran Cheema Prof Dr. Hina Zafar Raja Prof Dr. Fahad Mehtab Talal Ahmad, Umer Bhatti



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BLOCK-05



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*Module
No.15*

ENDOCRINOLOGY



MODULE RATIONALE

The Endocrinology module introduces the structure, function, and regulation of major endocrine glands and their hormones, emphasizing their role in growth, metabolism, calcium balance, and stress response. Understanding endocrine physiology and pathology enables dental students to recognize systemic and oral manifestations of hormonal disorders that influence dental health and treatment planning. The module links core principles from physiology, biochemistry, pharmacology, and pathology to clinical dental practice, highlighting conditions such as diabetes mellitus, thyroid disease, and calcium metabolism disorders. It also fosters the ability to interpret laboratory data, understand pharmacological management, and apply safe clinical decision making for patients with endocrine dysfunction.

MODULE Objectives

- Identify major endocrine glands, their hormones, and mechanisms of hormonal regulation.
- Explain the physiological roles of pituitary, thyroid, parathyroid, adrenal, and pancreatic hormones in maintaining metabolic and calcium homeostasis.
- Describe the synthesis, biochemical regulation, and clinical significance of thyroid, parathyroid, insulin, and vitamin D pathways.
- Interpret basic endocrine function tests, including thyroid and calcium-related profiles, in relation to systemic and oral findings.
- Recognize oral and systemic manifestations of common endocrine disorders such as diabetes mellitus, hypothyroidism, hyperthyroidism, and parathyroid dysfunction.
- Explain the pharmacological basis, uses, and precautions of major antidiabetic, antithyroid, and corticosteroid drugs relevant to dental care.
- Correlate endocrine disturbances with dental implications such as altered bone metabolism, salivary gland changes, and healing capacity.
- Demonstrate competency in interpreting endocrine-related case data and laboratory reports to support clinical reasoning and safe dental management.

SUBJECTS INTEGRATED IN THE MODULE



- Physiology
- Biochemistry
- Pharmacology & Therapeutics
- General Pathology & Microbiology

Syllabus

THEORY

PHYSIOLOGY

CODE	SPECIFIC LEARNING OUTCOMES	TOPIC	COGNITIVE	ATTITUDE	MIT	AT	VIDEO LINK
EnCP001	Enlist the major endocrine glands and their hormones.	Introduction to Endocrinology	C1	A1	LGIS/SGD	MCQs	https://www.khanacademy.org/science/health-and-medicine/advanced-endocrine-system
	Classify hormones broadly based on chemical structure (peptide, steroid, amine).		C2	A1	LGIS/SGD	MCQs	https://www.khanacademy.org/science/health-and-medicine/advanced-endocrine-system/endocrine-system-introduction/v/endocrine-gland-hormone-review
	Differentiate between surface and intracellular hormone receptors.						
	Explain the basic concept of feedback control in hormone secretion						
EnCP002	Describe the basic anatomy of pituitary gland and its relation to hypothalamus.	Pituitary Hormones and	C2	A1	LGIS/SGD	MCQs	https://www.khanacademy.org/test-prep/mcat/organ-

		Their Control by the Hypothalamus					systems/endocrine-system/v/hypothalamus-and-pituitary-gland
	Identify the main hormones of the anterior and posterior pituitary and state their primary functions		C2	A1	LGIS /SGD /CBL	MCQs	https://www.youtube.com/watch?v=9dS7bc2bUE
	Outline the effects of growth hormone on growth and metabolism						AND
	Explain the pathophysiology of growth-related disorders—dwarfism, gigantism, and acromegaly.						https://en.khanacademy.org/science/biology/crash-course-biology/crash-course-biology-science/v/crash-course-biology-132
	Describe the main functions of ADH (in water balance) and oxytocin (in labor and lactation).						
EnC-P003	Outline the basic functions of thyroid hormones.	Thyroid Gland	C2	A1	LGIS /SGD	MCQs	https://www.khanacademy.org/science/health-and-

							medicine/advanced-endocrine-system/endocrine-system-introduction/v/hormone-concentration-metabolism-negative-feedback
	Discuss the salient clinical features of major thyroid disorders: hyperthyroidism, hypothyroidism, cretinism, and myxedema		C4 / C1	A1	LGIS /SGD	MCQs	https://en.khanacademy.org/science/biology/crash-course-bioecology/crash-course-biology-science/v/crash-course-biology-132
EnC-P004	Outline the basic functions of parathyroid hormone, calcitonin, and vitamin D in calcium and bone metabolism.	Calcium Regulating Hormones	C2	A1	LGIS /SGD	MCQs	https://www.youtube.com/watch?v=EMJFqNOe3UI
	Describe clinical conditions associated with calcium imbalance: hypoparathyroidism, hyperparathyroidism, rickets, osteomalacia, and osteoporosis.		C2	A1	LGIS /SGD	MCQs	https://www.youtube.com/watch?v=66QgWReBAAy AND https://www.youtube.com/watch?v=036YVkojsPQ
EnC-P005	Name the main adrenal cortical hormones and describe the physiological functions	Adrenal Glands	C2	A1	LGIS /SGD	MCQs	https://www.khanacademy.org/test-prep/mcat/organ-

	of cortisol, and aldosterone.						systems/endocrine-system/v/endocrine-gland-hormone-review
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	Discuss the salient features of Cushing's syndrome and Addison's disease.						https://armandoh.org/video/addisons-disease/
EnC-P006	Describe the main actions of insulin and glucagon on carbohydrate, protein, and fat metabolism	Pancreas	C2	A1	LGIS/SGD	MC Qs	https://www.youtube.com/watch?v=Id2E72P8Fe0
	Differentiate between Type I and Type II diabetes mellitus based on etiology and pathophysiology.		C2	A1	LGIS/SGD	MC Qs	https://www.youtube.com/watch?v=RlLrvnnTD DU
	Discuss the general features and complications of diabetes mellitus.						https://www.mometrix.com/academy/diabetes-complications/

BIOCHEMISTRY

CODE	SPECIFIC LEARNING OUTCOMES	TOPIC	COGNITIVE	ATTITUDE	MIT	AT	VIDEO LINK
EnCB001	Outline the main steps of thyroid hormone synthesis (iodide uptake, iodination, coupling, storage, release)	Synthesis of Thyroid and Parathyroid Hormones	C2	A1	LGIS/SGD	MC Qs	https://www.youtube.com/watch?v=FCngwKqLaT0
	State how parathyroid hormone is synthesized and its		C2	A1	LGIS/SGD	MC Qs	https://armandoh.org/video/endocrinology-

	role in calcium regulation						calcium-and-phosphate-regulation/
EnCB002	Describe, in simple terms, how insulin and glucagon are produced in pancreatic islet cells	Synthesis of Insulin and Glucagon	C1 / C2	A1	LGIS/SGD	MC Qs	https://www.khanacademy.org/science/how-does-the-human-body-work/x0fe8768432761c62:chemical-coordination-and-integration/x0fe8768432761c62:adrenal-and-pancreas/v/pancreas-insulin-glucagon
	Explain the clinical significance of C-peptide (marker of insulin secretion)		C2	A1	LGIS/SGD	MC Qs	https://www.youtube.com/watch?v=Um4TiRkMSZ4 AND https://www.khanacademy.org/test-prep/mcat/biomolecules/fat-and-protein-metabolism/v/fatty-acid-oxidation-part-i
	Compare key features of Type 1 and Type 2 diabetes mellitus						

	Describe the pathways of beta-oxidation and ketogenesis and explain their metabolic significance.						
EnCB003	Describe vitamin D and its active form, sources, RDA, biochemical roles, and deficiency manifestations.	Vitamins	C2	A1	LGIS/SGD	MC Qs	https://www.youtube.com/watch?v=036YVkojsPo
EnCB004	Describe metabolism of calcium	Calcium	C2	A1	LGIS/SGD	MC Qs	https://www.classcentral.com/course/youtube-physiology-206707

PHARMACOLOGY & THERAPEUTICS

CODE	SPECIFIC LEARNING OUTCOMES	TOPIC	COGNITIVE	ATTITUDE	MIT	AT	VIDEO LINK
EnC-Ph-001	State the major effects of insulin on body tissues	Antidiabetic drugs: Insulin	C2	A1	LGIS/SGD	MC Qs	https://www.youtube.com/watch?v=Id2E72P8Fe0

	Classify types of insulin (short, intermediate, long-acting)		C2	A1	LGIS/SGD	MC Qs	https://www.youtube.com/watch?v=6S8uR3jzKQw
	Describe the uses and common side effects of insulin		C1	A1	LGIS/SGD	MC Qs	https://www.youtube.com/watch?v=LWDQyaKVols
	Recognize newer agents (SGLT2 inhibitors, incretin mimetics, DPP-4						

	inhibitors) at a basic level						
EnC-Ph-002	List the main groups of oral antidiabetic drugs (e.g., sulfonylureas, metformin, thiazolidinediones)	Oral antidiabetic drugs	C2	A1	LGIS/SGD	MC Qs	https://www.youtube.com/watch?v=LWDQyaKVols
	Explain in simple terms how these drugs lower blood glucose		C2	A1	LGIS/SGD	MC Qs	https://www.youtube.com/watch?v=LWDQyaKVols
	Identify common side effects and contraindications						
EnC-Ph003	Outline the synthesis and functions of thyroid hormones	Thyroid hormones & Antithyroid drugs	C2	A1	LGIS/SGD	MC Qs	https://www.youtube.com/watch?v=b7JFqG%EE%80%80Mi9pk
	State the drugs used in hypothyroidism		C2	A1	LGIS/SGD	MC Qs	https://www.njanerd.org/lecture/hyperthyroidism-physiology-pathophysiology-diagnosis-treatment-thyroid-storm/
	Explain the mechanism of action of main antithyroid drugs						
	Recognize the role of iodides and beta blockers in hyperthyroidism						
	List common toxicities of antithyroid drugs						

EnC-Ph-004	Recall the main adrenal steroid hormones (cortisol, aldosterone)	Adrenal hormones – I	C2	A1	LGIS/SGD	MC Qs	https://www.clascentral.com/course/youtube-pharmacology-drugs-for-pituitary-and-thyroid-disorders-made-easy-180556
	Recognize some synthetic glucocorticoids		C2	A1	Interactive Lecture /SGD/ LGIS	MC Qs	https://www.osmosis.org/learn/Glucocorticoids%26 mineralocorticoids: Nursing Pharmacology
	Differentiate between short-, intermediate-, and long-acting glucocorticoids.						
EnC-Ph-005	Describe the main pharmacological effects and therapeutic uses of glucocorticoids.	Adrenal hormones – II	C1	A1	LGIS/SGD	MC Qs	https://www.osmosis.org/learn/Glucocorticoids%26%20mineralocorticoids
	Outline their major adverse effects and precautions corticosteroids		C2	A1	LGIS/SGD	MC Qs	https://www.osmosis.org/learn/Glucocorticoids%26 mineralocorticoids: Nursing Pharmacology
	Explain the clinical implications and monitoring considerations in long term steroid use		C2	A1	LGIS/SGD	MC Qs	https://www.osmosis.org/learn/Adrenal insufficiency: Clinical sciences

	Describe their pharmacokinetics, mechanism of action, pharmacological effects, uses, adverse effects, drug interactions and contraindications of Corticosteroid Antagonists		C1	A1	LGIS/SGD	MC Qs	https://www.njanerd.org/lecture/potassium-sparing-diuretics-mechanism-of-action-indications-adverse-reactions-contraindications
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GENERAL PATHOLOGY & MICROBIOLOGY

CODE	SPECIFIC LEARNING OUTCOMES	TOPIC	COGNITIVE	ATTITUDE	MIT	AT	VIDEO LINK
EnC-Pa-001	Discuss the microbiological characteristics, disease spectrum and brief diagnosis of Prevotella.	Prevotella	C1	A1	LGIS/SGD	MC Qs	https://www.youtube.com/@MedicosisPerfectionalis
EnC-Pa-002	Discuss the microbiological characteristics, disease spectrum and brief diagnosis of Bacteroides.	Bacteroides	C2	A1	LGIS/SGD	MC Qs	https://www.osmosis.org/learn/Bacteroides_fragilis
EnC-Pa-003	Discuss the microbiological characteristics, disease spectrum and brief diagnosis of Lactobacillus	Lactobacillus	C4 / C1	A1	LGIS/SGD	MC Qs	https://www.youtube.com/watch?v=PxSVkERqIWc
EnC-Pa-004	Discuss the microbiological characteristics, disease spectrum and brief diagnosis of	Clostridium perfringens	C2	A1	LGIS/SGD	MC Qs	https://www.osmosis.org/learn/Clostridium%EE%80%80m_perfringens

	Clostridium perfringens						
EnC-Pa-005	Discuss the microbiological characteristics, disease spectrum and brief diagnosis of firmicutes	Firmicutes	C1	A1	LGIS/SGD	MC Qs	https://www.ninjanerd.org/lecture/bacteria-structure-and-function
EnC-Pa-006	Discuss the microbiological characteristics, disease spectrum and brief diagnosis of staphylococci	Staphylococci	C2	A1	LGIS/SGD	MC Qs	https://www.youtube.com/watch?v=6BkqWKOG%EE%80%80%E0
EnC-Pa-007	Discuss the microbiological characteristics, disease spectrum and brief diagnosis of HIV and its relation with dental surgery.	HIV	C1	A1	LGIS/SGD	MC Qs	https://www.youtube.com/watch?v=KvvECcXnDks



**BDS Integrated
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*Module
No.16*

OCCLUSION_II

MODULE RATIONALE

Occlusion II develops an integrated understanding of the biological, functional, and clinical aspects of occlusion by linking temporomandibular joint dynamics, neuromuscular control, periodontal responses, and dental relationships. The module emphasizes the determinants of normal and ideal occlusion, growth-related variations, and the impact of occlusal forces on oral structures. Through multidisciplinary integration, students are prepared to recognize occlusal patterns, identify deviations, and apply foundational concepts in diagnosis and clinical decision making.

MODULE Objectives and Outcomes

- Explain the anatomy and function of the temporomandibular joint (TMJ), including the articular disc, synovial fluid, ligaments, and joint stability.
- Describe neuromuscular control of mandibular movement, including the role of muscles of mastication, proprioceptors, and central regulation.
- Explain the role of periodontal structures (PDL and alveolar bone) in occlusal force distribution, proprioception, and adaptation (including Wolff's law).
- Describe occlusal curves, arch forms, and functional cusp relationships, and explain their role in masticatory efficiency.
- Explain facial growth, bone remodeling, and their influence on occlusion and facial profile.
- Define and differentiate static and dynamic occlusion, including centric relation, centric occlusion, maximum intercuspation, and excursive movements.
- Explain determinants of occlusion, including anterior (incisal and canine guidance) and posterior (TMJ/condylar guidance) factors.
- Describe characteristics of ideal occlusion and compare them with normal occlusion and malocclusion.
- Classify occlusal relationships using systems such as Angle's classification and Andrews' Six Keys of Occlusion.
- Explain occlusal features across different dentitions (deciduous, mixed, and permanent).
- Describe the role of orthodontics in the development and maintenance of occlusion, including preventive and interceptive approaches.
- Identify the effects of parafunctional habits (e.g., bruxism) on TMJ, teeth, and periodontal structures.



- Correlate occlusal concepts with clinical implications, including joint health, tooth wear, and functional disturbances.

SUBJECTS INTEGRATED IN THE MODULE

- Oral Biology & Tooth Morphology
- Prosthodontics
- Orthodontics
- Periodontology
- Oral & Maxillofacial surgery

Syllabus

THEORY							
ORAL BIOLOGY & TOOTH MORPHOLOGY							
CODE	SPECIFIC LEARNING OUTCOMES	TOPIC	COGNITIVE	ATTITUDE	MIT	AT	VIDEO LINK
Oc2-OB-001	Define the biological features of the temporomandibular joint relevant to occlusion, including the structure and function of the articular disc, synovial fluid, and cartilage adaptation	TMJ & Oral Biology	C1	A1	LGIS /SGD	MCQs	https://www.youtube.com/watch?v=TJd7lKC064
	Explain the neuromuscular control of mandibular movement, including the role of muscle spindles, Golgi tendon organs, and the central nervous system in maintaining occlusal stability.		C1	A1	LGIS /SGD /CBL	MCQs	https://www.osmosis.org/learn/Muscle_spindles_and_golgi_tendon_organ
Oc2-OB-002	Describe occlusal curves and explain their significance in masticatory efficiency	Occlusal Curves & Arch Form	C1	A1	LGIS /SGD	MCQs	https://www.youtube.com/watch?v=bRRfEzDcG-0
	Explain the concept of arch form		C2	A1	LGIS /SGD	MCQs	https://www.youtube.com/watch?v=bRRfEzDcG-0
	Describe the normal dental arch forms (tapered, ovoid, square)						

	Define supporting cusps and guiding cusps, and explain their functional role in occlusion.						
Oc2-OB-003	Explain the basic concepts of facial growth and bone remodeling Describe various facial types and profiles.	Facial Growth, Facial Types & Bone remodeling			LGIS /SGD		https://www.youtube.com/watch?v=EWBkZyWE%EE%80%8069A AND https://www.youtube.com/watch?v=IvOvHc5BGk

PERIODONTOLOGY

CODE	SPECIFIC LEARNING OUTCOMES	TOPIC	COGNITIVE	ATTITUDE	MIT	AT	VIDEO LINK
Oc2-Pe-001	Explain the basic concepts of periodontology, including the structure and function of the periodontium and its role in maintaining oral health.	Periodontium & Occlusal Response	C2	A1	LGIS /SGD	MCQs	https://www.youtube.com/watch?v=QuSjIQdOoko
	Describe the Physiology of Mastication and the role of mechanoreceptors in the PDL in regulating occlusal biting forces.		C2	A1	LGIS /SGD	MCQs	https://www.youtube.com/watch?v=ACwCzZC OzM AND https://www.youtube.com/watch?v=bxUeHI1aDww

	Describe the role of the periodontal ligament (PDL) in occlusal function, including mechanoreception, proprioception, and tooth mobility.						

PROSTHODONTICS

CODE	SPECIFIC LEARNING OUTCOMES	TOPIC	COGNITIVE	ATTITUDE	MIT	AT	VIDEO LINK
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Oc2-PD-001	Explain the characteristics of ideal occlusion in natural dentition and its significance for oral function and health.	Characteristics and Significance of Ideal Occlusion	C2	A1	LGIS /SGD /CBL	MCQs	https://www.youtube.com/watch?v=P8rStQ50%EE%80%80ab4
	Define the Anterior & posterior determinants (TMJ morphology, condylar guidance) incisal guidance, canine guidance of occlusion).		C2	A1	LGIS /SGD	MCQs	https://www.youtube.com/watch?v=QUjCJ7vBgIA AND https://www.youtube.com/watch?v=WTi-0eg8nI0 AND

							https://www.youtube.com/watch?v=63UJmklHe2Q
	Define & differentiate between static occlusion (centric occlusion, centric relation, maximum intercuspation) and dynamic occlusion (working side, balancing side, protrusive and lateral excursions).						
	Enumerate the key features of occlusion in deciduous, mixed & permanent dentition						
ORAL & MAXILLOFACIAL SURGERY							
CODE	SPECIFIC LEARNING OUTCOMES	TOPIC	COGNITIVE	ATTITUDE	MIT	AT	VIDEO LINK
Oc2-OMFS- 001	Describe the biological features of the temporomandibular joint relevant to occlusion	Review of TMJ anatomy & Its Occlusal relevance	C2	A1	LGIS /SGD /FLI PPED CLAS SROOM	MCQs	https://www.youtube.com/watch?v=w3dPBf5E%EE%80%80Pps
	Summarize the anatomy of TMJ, including TMJ ligaments and the muscles of mastication		C2	A1	LGIS /SGD	MCQs	https://www.osmosis.org/learn/Anatomy_of_the_temporomandibular_joint_and_muscles_of_mastication

	Compare the condyle disc complex and mandibular fossa						
	Explain the role of synovial fluid in joint maintenance						
	Discuss the importance of joint stability and intra-articular pressure						
ORTHODONTICS							
CODE	SPECIFIC LEARNING OUTCOMES	TOPIC	COGNITIVE	ATTITUDE	MIT	AT	VIDEO LINK
Oc2-OtD-001	Define Orthodontics & describe the branches of Orthodontics.	Introduction to Orthodontics & Development of Occlusion & Dentition	C2	A1	LGIS/SGD	MCQs	https://www.youtube.com/playlist?list=P_LbcTc7tH7Yf6NJ8JmDsZ3pUbCr2_L9COj
	Explain the relevance of preventive and interceptive orthodontics to the development of occlusion and dentition during the primary and mixed dentition periods.						https://www.youtube.com/watch?v=63UJmklHe2Q
Oc2-OtD-002	Define overjet, and overbite.	Normal Occlusion, Occlusal	C2	A1	Interactive lecture/sgd	MCQs	https://www.youtube.com/watch?v=R-clVo_dNYo AND

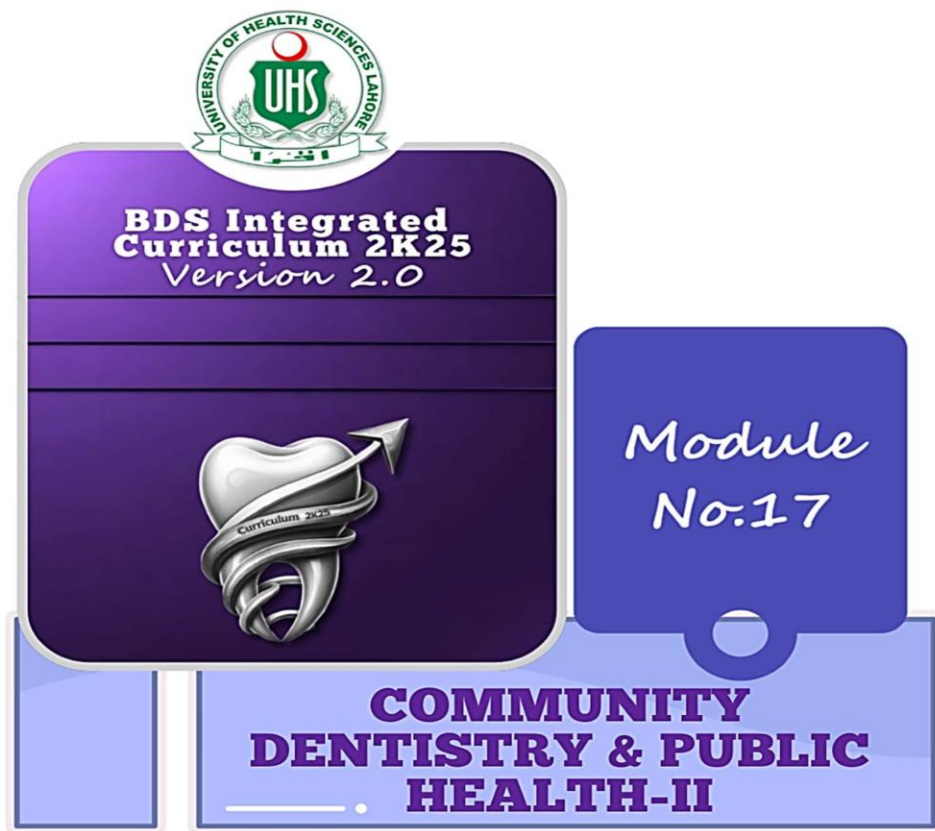
							https://www.youtube.com/shorts/frgGNg0UfQ
	Define and differentiate between ideal occlusion, normal occlusion and malocclusion.	Relations hips and Key Characteristics	C2	A1	LGIS /SGD	MCQs	https://www.youtube.com/watch?v=t6isvvhUAHw
	Enumerate Andrews' Six Keys of occlusion & its functional significance. What is classification of normal incisor, canine, and molar relationships (using Angle's classification system)		C1 / C2	A1	LGIS /SGD	MCQs	https://www.youtube.com/watch?v=AUT2XF1aTfo AND https://www.youtube.com/watch?v=rC0k4L65hvM AND https://www.youtube.com/watch?v=P8rStQ50ab4

Practical / Lab work

ORTHODONTICS

CODE	SPECIFIC LEARNING OUTCOMES	TOPIC	COGNITIVE	ATTITUDE	MIT	AT	VIDEO LINK
Oc2-OtD-003	Measure overjet and overbite accurately using a periodontal probe or ruler using study models.	Overjet & Overbite	C2	A1	Demonstration, Hands-on	OSCE/O SPE/OSVE	https://www.youtube.com/watch?v=VTHxel7Chfc

					Skill Lab / Small Group Practical		
Oc2-OtD-004	Classify occlusion based on Angle's classification using study models.	Angle's classification	C1	A1	Demonstration, Hands-on Skill Lab / Small Group Practical	OSCE /OSP E/OS VE	https://www.youtube.com/watch?v=y2qPsG26A4Q AND https://www.youtube.com/watch?v=AUT2XF1aTfo AND https://www.youtube.com/watch?v=rCOk4L65hvM



MODULE RATIONALE

Community Dentistry and Public Health II builds on foundational public health concepts to develop competencies in oral health promotion, healthcare systems, and service planning. The module emphasizes behavioral sciences, health education, and patient-centered care to address oral health inequalities and improve treatment adherence. It prepares students to design, implement, and evaluate preventive programs while integrating ethical, psychological, and socio-cultural aspects into clinical and community practice.

MODULE OUTCOMES/ OBJECTIVES

- Explain principles of oral health promotion and apply models such as the Ottawa Charter in designing preventive strategies.
- Describe the structure and function of healthcare systems, including Primary Health Care and factors influencing access and delivery of dental services.
- Explain concepts of health service planning, evaluation, and quality assurance, including audit cycles and needs assessment.
- Apply principles of health economics and describe financing and remuneration systems in oral healthcare.
- Identify barriers to oral healthcare access and propose strategies to improve equity for disadvantaged populations.
- Explain oral health education principles, including educational models, approaches, and levels of prevention.
- Design and deliver oral health education interventions in community and clinical settings.
- Apply epidemiological and public health principles in planning and evaluating oral health programs.
- Explain the roles of dental auxiliaries in oral healthcare delivery systems.
- Integrate behavioral science theories (learning theories, motivation, Health Belief Model) to promote behavior change in patients.
- Demonstrate effective counselling and communication skills, including motivational interviewing and patient-centered approaches.
- Recognize and manage psychological conditions such as anxiety, depression, and stress in dental patients, including appropriate referral.
- Apply ethical principles and professional responsibilities in clinical decision-making, including consent, confidentiality, and safeguarding.
- Demonstrate advanced communication skills, including breaking bad news (SPIKES), managing difficult patients, and culturally sensitive interactions.
- Assess psychosocial determinants of oral health, including family, socioeconomic, and cultural influences.
- Promote patient adherence and behavioral change through evidence-based strategies.
- Conduct community-based oral health assessments and apply indices (e.g., CPITN) to determine treatment needs.



- Demonstrate professionalism, teamwork, and self-awareness, including managing stress and burnout in dental practice.

SUBJECTS INTEGRATED IN THE MODULE

- Community & Preventive Dentistry
- Behavioral Sciences

Syllabus

THEORY							
COMMUNITY & PREVENTIVE DENTISTRY							
CODE	SPECIFIC LEARNING OUTCOMES	TOPIC	COGNITIVE	ATTITUDE	MIT	AT	VIDEO LINK
CDPH2 - CD-001	Define oral health promotion and outline its key principles	Oral health promotion	C1 / C2	A1	Interactive lecture / SGD	MCQs	https://www.cdc.gov/dental-public-health-residency/php/lecture-series/index.html
	Apply the principles of health promotion and disease prevention to design oral health strategies.		C1 / C2	A1	Interactive lecture / SGD	MCQs	https://www.youtube.com/watch?v=dn1-S_6mMHE
	Describe the five areas for action in the Ottawa Charter and illustrate each with oral health examples.						AND
	List potential partners and community settings for oral health promotion activities						https://m.youtube.com/watch?v=Pa_hFKaeK6I

CDPH2 - CD-002	Define and classify dental auxiliaries, and describe their roles in oral health delivery systems	Dental Auxiliaries	C1 / C2	A1		MCQs	https://youtu.be/_gylZPPduKyk?si=UiwHjEX3885rFkS6
CDPH2 - CD-003	Discuss the Primary Health Care (PHC) approach and explain the principles of the Alma-Ata Declaration.	Introduction to the health care system	C2	A1	Interactive lecture / SGD	MCQs	https://www.youtube.com/watch?v=NPtpYsl_aqY AND https://www.youtube.com/watch?v=wT6_YiUoDgU
	Outline factors influencing the development and evaluation of healthcare systems.				Interactive lecture / SGD		https://www.youtube.com/watch?v=GKsZhTUG_jE AND https://www.youtube.com/watch?v=qqrr8db97Tw
	Describe the different components of a healthcare system						
	Outline the criteria for evaluating healthcare systems						
CDPH2 - CD-004	Define quality in healthcare and explain the quality assurance/audit cycle.	Quality assurance cycle	C2	A1	Interactive lecture / SGD	MCQs	https://www.youtube.com/watch?v=zQ7D4ifzYtU
	Discuss the models of access to healthcare and apply the concept		C2	A1	Interactive lecture / SGD	MCQs	https://youtu.be/_WfNwww5GB54?si=2QdKfrovixo0pHTT

	practically in a dental setting.						
CDPH2 - CD-005	Define planning and explain the steps of the rational planning model for dental services.	Planning dental services	C2	A1	Interactive lecture / SGD	MCQs	https://youtu.be/qfVbOmCmka4?si=Edh295fM5YGxmpXr
	Describe evaluation and its types, and identify the range of information needed for dental service planning.		C1	A1	Interactive lecture / SGD	MCQs	https://www.youtube.com/watch?v=XNR3KZzDoGQ AND https://www.futurelearn.com/info/courses/health-promotion/0/steps/218840
	Define concepts of need						

	Outline the stages necessary in planning strategy.		C1	A1	Lecture	MCQs	https://www.youtube.com/watch?v=Ij5BNbQVj6s
CDPH2 - CD-006	Explain the basic principles of health economics and outline payment and remuneration systems in oral health care.	Financing oral health care	C1	A1	Interactive lecture / SGD	MCQs	https://www.youtube.com/watch?v=iy-fhpbTH9E AND https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8469501/

	Explain the Health goals of a program		C1	A1	Interactive lecture / SGD	MCQs	https://www.youtube.com/watch?v=zUPovtYVMZk
CDPH2 - CD-007	Describe common problems with healthcare delivery	Problem with health care services and health care system	C1	A1	Interactive lecture / SGD	MCQs	https://www.osmosis.org/learn/Issues and Changes Affecting Health Care Delivery
	Discuss different barriers to dental care reception		C1	A1	Interactive lecture / SGD	MCQs	https://www.youtube.com/playlist?list=PLvyrp9iOILTQZnCu4eUceV2-KHeqGazsZO AND https://www.youtube.com/watch?v=lj_5kk09l9U AND https://www.youtube.com/watch?v=4lCdV0wI-jk
	Define the terms 'access to care /and barriers to care						
	Outline how the barriers to care might be overcome for disadvantaged groups						
CDPH2 -	Define determinants of health and equality	Dental Public Health	C1	A1	Interactive	MCQs	https://www.restoredcdc.org/www.cdc.gov/heal

CD-008					lecture / SGD		th-equity/what-is/video.html
CDPH2 - CD-009	Describe the educational process with its domains	Oral Health Education	C1	A1	Interactive lecture / SGD	MCQs	https://www.youtube.com/watch?v=ayefSTAnCR8 AND https://www.cd.c.gov/healthy-schools-training/about/e-learning-series-professional-development-101-and-201.html AND https://www.youtube.com/watch?v=2hE_XjCekfs
	Explain the concept of educational theories/ models		C1	A1	Interactive lecture / SGD	MCQs	https://www.youtube.com/watch?v=EH0qPSzHdNc AND https://study.com/academy/lesson/video/health-belief-model-definition-theory-examples.html

							https://www.youtube.com/watch?v=TlGe80Mi85U
	Define Oral health education, its settings, and approaches						
	Describe the objectives of oral health education						
	Identify principles of oral health education						
	Explain the steps in planning Oral Health Education						
	Discuss the three levels of prevention of oral diseases						
	Discuss the health care system and the levels of prevention per Pakistani system						

BEHAVIORAL SCIENCES							
CODE	SPECIFIC LEARNING OUTCOMES	TOPIC	COGNITIVE	ATTITUDE	MIT	AT	VIDEO LINK
CDPH2 - BhS-001	Describe strategies to strengthen emotional intelligence (EQ) and	Emotional Intelligence	C2 / C3	A2	Demonstration, Hands	MCQs	https://www.youtube.com/watch?v=IBUjfJEqSM

	apply cognitive abilities effectively in dental settings.	(EQ)			-on Skill Lab / Small Group Practical		
CDPH2 - BhS-002	Describe how genetic, environmental, and social factors shape personality and intelligence in dental professionals and patients.	Personality Factors	C2	A1	Interactive lecture / SGD	MCQs	https://www.youtube.com/watch?v=t2NHsNeOz0Y AND https://www.youtube.com/watch?v=t2NHsNeOz0Y
CDPH2 - BhS-003	Explain the interplay of nature vs nurture in shaping behaviors and characteristics relevant to dental practice.	Nature vs Nurture	C2	A1	Interactive lecture / SGD	MCQs	https://the-probe.co.uk/blog/2025/06/nature-vs-nurture-a-k-a-genetics-vs-behaviour/ AND https://www.nationaldentalcare.com.au/blog/nature-vs-nurture-is-your-oral-health-down-to-your-genes
CDPH2 - BhS-004	Utilize reinforcement, motivation, and feedback, and apply Behaviorism, Social Learning Theory	Learning Theories	C3	A2	Lecture / SGD	MCQs	https://www.periodontalcare.scdcep.org.uk/supporting-tools/oral-hygiene-

	(Bandura), and Cognitive Theory to achieve effective oral health behavior change in dental patients.						tips/oral-hygiene-tips-video/
CDPH2 - BhS-005	Define motivation, distinguish intrinsic from extrinsic types, and apply motivational theories to improve treatment adherence in dental patients.	Motivational Theories	C1 / C2 / C3	A2	Lecture	MCQs	https://www.khanacademy.org/test-prep/mcat/behavior/behavior-and-genetics/v/intrinsic-and-extrinsic-motivation AND https://prevention.cancer.gov/resources-and-training/self-determination-theory-motivation
CDPH2 - BhS-006	Describe and apply the Health Belief Model to promote preventive and treatment-related oral health behaviors in dental patients.	Health Belief Model	C2 / C3	A2	Demonstration, Hands-on Skill Lab / Small Group Practical	MCQs	https://www.youtube.com/watch?v=ndLTCy9ibTg&utm_source=chatgpt.com
CDPH2 - BhS-008	Explain basic counselling principles and the	Counselling Principles	C2	A2	Lecture	MCQs	https://open.umich.edu/find/open-educational-resources/denti

	role of counselling in dental healthcare.						stry/patient-communication-skills?utm_source=chatgpt.com
CDPH2 - BhS-008	Compare paternalistic, shared, and informed doctor-patient relationship models and apply them to guide clinical interactions in dentistry.	Doctor-Patient Relationship Models	C2 / C3	A3	Lecture / SGD	MCQs	https://youtu.be/4ueDJEfytMI?si=JY5Do6IEvTAVPF1
CDPH2 - BhS-009	Recognize signs of anxiety, depression, and psychological distress in dental patients.	Psychological Distress -- Recognition	C1 / C4	A2	Interactive lecture / SGD	MCQs	https://www.ihhs.gov/dentalcd/index.cfm?c=10405&cat=general&fuseaction=course.display&order=desc&sort=title&year=2020&utm_source=chatgpt.com AND https://dentistry.ucla.edu/patient-care/clinic-locations/westwood-clinics/special-patient-care-hospital-dentistry/resources-for-patients/desensitization-resources?utm_source=chatgpt.com

CDPH2 - BhS- 010	Initiate appropriate referral to mental health services or apply CBT-based management strategies for distressed dental patients.	Psychological Distress -- Management	C3	A3	Lecture / SGD	MCQs	https://learn.nhs.uk/scot/41063?utm_source=chatgpt.com
CDPH2 - BhS- 011	Explain how family dynamics, parenting styles, and help-seeking behaviors influence dental attendance and patient cooperation.	Family Dynamics & Help-Seeking					https://open.umich.edu/find/open-educational-resources/dentistry/patient-communication-skills?utm_source=chatgpt.com
CDPH2 - BhS- 012	Describe how socioeconomic factors and social constructs (gender roles, stigma, cultural norms) shape oral health perceptions and outcomes.	Social Constructs & Inequalities	C2	A2	Interactive lecture / SGD	MCQs	https://www.ncbi.nlm.nih.gov/training/videolectures/section-3-presentation-overview-and-definition-of-social-determinants
CDPH2 - BhS- 013	Explain the relationship between stress, psychosocial factors, and oral health outcomes and assess impact on quality of life.	Psychosocial Impact on Oral Health	C2	A3	Interactive lecture / SGD	MCQs	https://vivalearning.com/on-demand-dental-course/healthful-living-in-a-stressed-out-anxious-world-part-1?utm_source=chatgpt.com
CDPH2 -	Describe psychosocial aspects of chronic illness and	Chronic Illness &	C2 / C5	A2	Interactive	MCQs	https://www.ahrq.gov/ecareplan/videos/manag

BhS-014	hospitalization and their impact on dental care and patient cooperation.	Hospitalization			lecture / SGD		ing-mcc.html?utm_source=chatgpt.com
CDPH2 - BhS-015	Explain palliative care principles, psychosocial support strategies, and management of medically unexplained oral symptoms in dental and oral oncology settings.	Palliative & Special Care	C2	A2	Interactive lecture / SGD	MCQs	https://www.dentalhealth.org/module-11-palliative-care?utm_source=chatgpt.com
CDPH2 - BhS-016	Describe the SPIKES protocol and explain principles of breaking bad news in dental scenarios.	Breaking Bad News -- Principles	C2	A3	Interactive lecture / SGD	MCQs	https://youtube.com/MKnWkrPLGOs?si=4ahiQyBskBEYsJKl
CDPH2 - BhS-017	Identify ethical dilemmas in dental practice (autonomy, consent, confidentiality) and apply established bioethical frameworks (beneficence, non-maleficence, justice) to analyze and resolve them.	Ethical Dilemmas -- Frameworks Professional Responsibility	C2	A3	Lecture / Role Play	MCQs	https://www.ada.org/en/resources/ada-library/oral-health-topics/ethics
	Reflect on professional responsibilities when navigating ethical conflicts involving cultural sensitivity, dual obligations, and patient welfare.		C4 / C3 / C5	A3 / A4	SGD / Seminar	MCQs	https://engage.ada.org/courses/190/view?utm_source=chatgpt.com AND



							https://thinkculturalhealth.hhs.gov/education/oral-health-providers?utm_source=chatgpt.com
CDPH2 - BhS- 018	Recognize how behavior affects oral health outcomes and develop evidence-based strategies to promote healthy oral behaviors.	Behavioral Influences on Oral Health	C1 / C6	A2	Lecture / SGD	MCQs	https://www.ada.org/resources/research/science/evidence-based-dental-research/tutorials?utm_source=chatgpt.com
CDPH2 - BhS- 019	Evaluate factors influencing patient adherence and apply behavior change strategies to improve oral health outcomes. Explain the impact of low health literacy on oral health outcomes and treatment adherence.	Patient Adherence	C5 / C3 / C2	A3	Lecture / SGD	MCQs	https://pmc.ncbi.nlm.nih.gov/articles/PMC12475263/?utm_source=chatgpt.com https://www.cdc.gov/health-literacy/php/about/index.html
CDPH2 - BhS- 020	Recognize signs of stress and burnout in dental professionals and apply evidence-based coping strategies to maintain wellbeing	Dentist Stress & Burnout	C1 / C3	A4	Workshop / Lecture	MCQs	https://med.stanford.edu/medicine/about/diversity-equity-inclusion/wellbeing.html



	and clinical performance.						
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PRACTICALS / LAB WORK							
COMMUNITY & PRESVENTIVE DENTISTRY							
CODE	SPECIFIC LEARNING OUTCOMES	TOPIC	COGNITIVE	ATTITUDE	MIT	AT	VIDEO LINK
CDPH2 - CD-010	Deliver a short OHE message to classmates using lab models (tooth models, charts, typodonts).	Oral Health Education	P3	A2	Demonstration / Hands-on	OSCE/OSPE/OSVE	https://learninghub.nhs.uk/Resource/73655?utm_source=chatgpt.com
CDPH2 - CD-011	Classify example cases into primary, secondary, and tertiary prevention using different scenarios	Levels of Prevention Classification	C4 (<i>Practical Application</i>)	A1	Small Group Discussion	OSCE/OSPE/OSVE	https://www.youtube.com/watch?v=KhcVodlemg&utm_source=chatgpt.com
CDPH2 - CD-012	Conduct a community-based periodontal health assessment by performing structured history taking and CPITN screening using WHO criteria, and determine periodontal treatment needs.	Community Visit 2: Periodontal Health Assessment Activity	P3 / C4	A3	Community Fieldwork / Demo	OSCE/OSPE/OSVE	https://www.youtube.com/watch?v=jCjB6QaQHs&utm_source=chatgpt.com AND https://www.youtube.com/watch?v=WWerbYkX5W8&utm_source=chatgpt.com
BEHAVIORAL SCIENCES							

CODE	SPECIFIC LEARNING OUTCOMES	TOPIC	COGNITIVE	ATTITUDE	MIT	AT	VIDEO LINK
CDPH2 - BhS-021	Apply structured advanced communication and demonstrate interprofessional teamwork in complex patient scenarios.	Advanced Communication	P3 / C3	A3	Role-play / Simulation	OSCE/ OSPE/ OSVE	https://www.ahrq.gov/teamstepps-program/resources/additional/sbar-inpatient.html?utm_source=chatgpt.com AND https://www.ahrq.gov/teamstepps-program/resources/additional/cus-teachback.html?utm_source=chatgpt.com
CDPH2 - BhS-022	Demonstrate non-judgmental, culturally sensitive communication with patients affected by stigma or social barriers.	Cultural Sensitivity & Health Disparities	P3 / A3	A3	Role-play / Simulation	OSCE/ OSPE/ OSVE	https://thinkculturalhealth.hhs.gov/education/oral-health-providers?utm_source=chatgpt.com
CDPH2 - BhS-023	Implement appropriate behavior change techniques (e.g., motivational interviewing, goal setting) to improve patient adherence to oral health	Behavior Change Strategies	P3 / C3	A3	Simulated Patient Exercise	OSCE/ OSPE/ OSVE	https://youtu.be/f8QSA_5PEFM?si=6iMvq8UcFLcTzytG

	recommendations in a simulated consultation.						
CDPH2 - BhS-024	Differentiate biological and environmental factors in dental case scenarios and explain their impact on patient behavior.	Case Analysis -- Nature vs Nurture	C4	A2	Case-Based Learning	OSCE/ OSPE /OSV E	https://www.youtube.com/watch?v=zKb3uwnYjzM
CDPH2 - BhS-025	Demonstrate professional behavior in dental practice by effectively resolving complaints, maintaining confidentiality, patient refusal and applying ethical decision-making.	Ethical dilemmas			Demonstration	OSCE/OSPE/OSVE	http://www.youtube.com/watch?v=dkXjQM81KKA
CDPH2 - BhS-026	Demonstrate the SPIKES protocol in a simulated bad news consultation.	Breaking Bad News (SPIKES)	P3 / C4	A4	Simulated Consultation	OSCE/ OSPE/ OSVE	http://www.youtube.com/watch?v=WsPFWMtquHo
CDPH2 - BhS-027	Apply MI techniques to improve patient adherence to oral hygiene.	Motivational Interviewing	P3 / C3	A3	Role-play / Simulation	OSCE/ OSPE/ OSVE	http://www.youtube.com/watch?v=WsPFWMtquHo
CDPH2 - BhS-038	Demonstrate ethical informed consent ensuring autonomy and patient understanding.	Informed Consent	P3 / C3	A3	Role-play / Hands-on	OSCE/OSPE/OSVE	https://gdcuk.azurewebsites.net/news-blogs/blog/detail/blogs/2026/02/24/how-patient-consent-can-help-build-

							trust-and-confidence
CDPH2 - BhS-029	Respond appropriately to safeguarding scenarios including child abuse and domestic violence.	Safeguarding	P3 / C3	A3	Role-play / Simulation	OSCE/ OSPE/ OSVE	http://www.youtube.com/watch?v=f8QSA_5PEFM
CDPH2 - BhS-030	Analyze patient misinformation and recommend an evidence-based management strategy.	Misinformation Management	C3 / C4	A4	Case Simulation / Role-play	OSCE/ OSPE/ OSVE	http://www.youtube.com/watch?v=dkXjQM81KKA
CDPH2 - BhS-031	Manage aggressive, anxious, or non-adherent patients using behavioral approaches without compromising ethics.	Managing Difficult Patients	C4 / C3	A2	Role-play / Case Exercise	OSCE/ OSPE/ OSVE	https://oasisdiscussions.ca/2023/03/13/motivational-interviewing-in-dentistry/#videoPlayer
CDPH2 - BhS-032	Manage a simulated anxious patient using advanced behavioral desensitization and structured reassurance techniques beyond Tell – Show - Do.	Advanced Dental Anxiety Management	P3 / C3	A3	Simulated Consultation	OSCE/ OSPE/ OSVE	https://www.youtube.com/watch?v=f8QSA_5PEFM



**BDS Integrated
Curriculum 2K25**
Version 2.0



*Module
No.18*

**DENTAL MATERIALS & PRE-
CLINICAL DENTISTRY-II**

DEPARTMENT OF DENTAL EDUCATION



MODULE RATIONALE

This module builds upon foundational knowledge to develop students' understanding of direct restorative materials and their clinical application in operative dentistry and prosthodontics. It integrates the science of dental materials including amalgam, composites, glass ionomers, and cements with principles of adhesion, manipulation, and material selection for specific clinical situations. Additionally, the module introduces essential prosthodontic concepts such as jaw relations and occlusion, alongside practical skills like fabrication of denture base plates. Through hands-on training in cavity preparation, restoration, and finishing procedures, the module aims to enhance students' technical competence, critical thinking, and ability to deliver functionally and aesthetically sound restorations.

MODULE OUTCOMES

- Describe the fundamental requirements of direct restorative materials.
- Describe the composition, manipulation and properties of amalgam.
- Describe the hybrid layer and specify the roles of etchant, primer and adhesive.
- Describe the composition, properties and polymerization of composite and categorize materials based on filler particle size.
- Classify dental cements. Differentiate between temporary and permanent cements. Explain the manipulation, setting characteristics and clinical applications of major dental cements.
- Describe the composition and properties of glass ionomer cements.
- Demonstrate the mixing of amalgam and manipulation of dental cements.
- Describe the vertical jaw relations.
- Describe the basic features of natural and artificial occlusion.
- Demonstrate the fabrication procedure of upper and lower base plates for complete dentures.
- Explain principles of Class I cavity preparation and material selection (amalgam vs composite).
- Demonstrate step-by-step Class I cavity preparation and restorations on typodont for both amalgam and composite restorations.
- Perform finishing and polishing of restorations to achieve proper anatomy, marginal integrity, and occlusion.

SUBJECTS INTEGRATED IN THE MODULE



- Science of Dental Materials
- Pre-clinical Operative Dentistry
- Pre-clinical Prosthodontics

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THEORY							
SCIENCE OF DENTAL MATERIALS							
CODE	SPECIFIC LEARNING OUTCOMES	TOPIC	COGNITIVE	ATTITUDE	MIT	AT	VIDEO LINK
DMPD2D M-001	Outline the essential requirements of direct filling restorative materials.	Fundamental Requirements of Direct Restorative Materials	C1 / C6	A1	Interactive lecture / SGD	MCQs	https://www.youtube.com/results?search_query=dental+materials+lecture
DMPD2- DM-002	Describe and relate the function of each component of dental amalgam alloy to its physical properties.	Dental Amalgam Composition	C1 / C6	A1	Interactive lecture / SGD	MCQs	http://www.youtube.com/watch?v=fDhCip2qrKk
	Explain the role of the mercury-alloy ratio and its effect on the setting reaction and long-term performance of amalgam restorations.		C1	A1	Interactive lecture / SGD	MCQs	AND http://www.youtube.com/watch?v=WyiLL1CpDeQ&start=2
	Correlate the manipulation parameters of amalgam with the mechanical and						https://www.youtube.com/watch?v=5CXhFocUKTM

	physical properties of the final restoration.						
	Evaluate the evidence on amalgam toxicity and justify its clinical safety in comparison with other environmental and dietary sources of mercury exposure.						
	Explain mercury hygiene guidelines and describe the protocols for safe amalgam waste disposal.						
DMPD2-DM-003	Define the hybrid layer. Explain how resin infiltrates and demineralizes dentin to create the "interdiffusion zone".	Dentin bonding agents	C1	A1	Interactive lecture / SGD	MCQs	https://www.youtube.com/watch?v=Nkes1aqnkMw AND https://www.youtube.com/watch?v=x8EcLrc2e8g
	Explain why bonding to wet, organic dentin is harder than bonding to dry, inorganic enamel.		C1	A1	Interactive lecture / SGD	MCQs	https://www.youtube.com/watch?v=Nkes1aqnkMw AND https://pubmed.ncbi.nlm.nih.gov/articles/PMC10488680/
	Describe how this cutting debris is either						AND

	removed or modified by different bonding systems.						https://www.sciencedirect.com/science/article/pii/S1882761621000442
	Differentiate the specific roles of the Etchant(acid), Primer(monomer) and Adhesive(resin).						
	Categorize agents by generation (1st - 8th) and by strategy (Etch and Rinse vs. Self-Etch)		C2	A1	Interactive lecture / SGD	MCQs	
	Explain how keeping dentin moist prevents the collapse of collagen fibers during the procedure.		C2	A1		MCQs	
DMPD2-DM-004	Describe the composition. Detail the roles of the organic matrix (Bis-GMA), inorganic fillers and the silane coupling agent in the composition structure	Composites	C2	A1	Lecture	MCQs	https://www.youtube.com/watch?v=2fT4E1pXlg
	Categorize materials based on filler particle size (Macro, Micro, Hybrid, Nano, Bulk fill) and explain how this determines clinical use.		C2	A1	Lecture	MCQs	https://www.youtube.com/watch?v=hUJViaMw5k
	Explain the polymerization process.		C2	A1	Lecture	MCQs	

	Describe the chemical stages of light activation and the function of the photo-initiator Camphor quinone.						
	Discuss polymerization shrinkage. Explain the mechanism of “setting stress” and how it leads to marginal microleakage and post-operative sensitivity.		C2	A1	Lecture	MCQs	https://youtube.com/shorts/MPZdIZbf08M?si=TlqSk5OZdVpKML5A
	Analyze the C-Factor (configuration factor). Describe the relationship between bonded and unbonded tooth surfaces and how it dictates incremental layering.		C4	A1	Lecture	MCQs	https://www.youtube.com/watch?v=hUJViaMw5k
	Differentiate material properties. Compare the viscosity, flow and		C2	A1	Interactive lecture/SGD	MCQs	https://www.youtube.com/watch?v=fFKf8OcHu1k

	mechanical strength of Flowable vs. Packable composites.						
	Explain the role of Coupling Agent. Describe how Silane creates a chemical bond between the filler particles and the resin matrix to ensure structural integrity.		C2	A1	Interactive lecture/SGD	MCQs	https://youtu.be/GtkycqOJC8?si=qdsrcljeFBOFfDKmY
	Outline finishing and polishing protocol. Describe the sequence of using abrasive instruments to achieve a surface that resists plaque accumulation.		C2	A1	Interactive lecture/SGD	MCQs	https://www.youtube.com/watch?v=yaXRRfDcefs
DMPD 2-DM-005	Classify dental cements according to composition and clinical use.	Dental Cements	C2	A1	Interactive lecture/SGD	MCQs	https://www.youtube.com/watch?v=8mflQ7ygHU8
	Differentiate between temporary and permanent		C2	A1	Interactive lecture	MCQs	https://www.youtube.com/watch?

	cements based on composition, strength, and clinical application.				re/SGD		v=Ds03-3shg 4
	Explain the manipulation, setting characteristics, and clinical applications of major dental cements including zinc phosphate, GIC, calcium hydroxide, zinc polycarboxylate and ZOE.		C2	A1	Interactive lecture/SGD	MCQs	https://www.youtube.com/watch?v=xRzotcjFEw
DMPD 2-DM-006	Describe the chemical composition and key properties of Glass Ionomer Cements GIC.	Glass Ionomer Cements	C2	A1	Interactive lecture/SGD	MCQs	https://www.youtube.com/watch?v=Qzb0mODfp8Y
	Correlate the constituents of GIC with its physical and biological properties.		C4	A1	Interactive lecture/SGD	MCQs	https://www.youtube.com/watch?v=sXcw0zWlMKo
	Explain the setting reaction, fluoride release ion exchange and environmental interaction		C2	A1	Interactive lecture/SGD	MCQs	

	mechanisms of GIC.						
	Explain the rationale behind the development of resin-modified glass ionomers and describe their advantages over conventional glass ionomer cements.		C2	A1	Interactive lecture/SGD	MCQs	https://www.youtube.com/watch?v=ZQPGwiB-gBM
	Explain how modifications in GIC composition influence material properties and clinical performance.		C4	A1	Interactive lecture/SGD	MCQs	https://youtu.be/BzzR9CC59q0?si=bo21atHxF53N3sN3
	Describe the composition, properties and clinical indications of metal reinforced glass ionomers (cermet's).		C2	A1	Interactive lecture/SGD	MCQs	https://youtu.be/oWfkA0AMi7E?si=0BirdbDfdFZj91D3

OPERATIVE DENTISTRY							
CODE	SPECIFIC LEARNING OUTCOMES	TOPIC	COGNITIVE	ATTITUDE	MIT	AT	VIDEO LINK

DMPD2-OD-001	Outline the principles and steps of tooth preparation for class I amalgam cavity design on mandibular molars, maxillary molars and premolars utilizing principles of cavity preparations .	Class I cavity preparation for amalgam	C2	A1	Interactive lecture/ SGD	MC Qs	https://youtu.be/prOP05wL4zM?si=xXbwkgD6VQJNoy6V
DMPD2-OD-002	Understand the objectives of pulp protection and clinical considerations	Liners and Bases	C2	A1	Interactive lecture/ SGD	MC Qs	https://youtu.be/m3t2EWs4HRg?si=9BHkbd6aHBAPowCb
DMPD2-OD-003	Describe the principles of restoration design for amalgam, including condensation, carving, finishing, and the factors influencing marginal integrity and longevity of the restoration	Amalgam Restorations in Class I	C2	A1	Interactive lecture/ SGD	MC Qs	https://youtube.com/shorts/onm9CA6Fc5I?si=nXS_plaVWcLNfUo4
DMPD2-OD-004	Describe the indications	Class I Composite Restorations	C2	A1	Interactive	MC Qs	https://youtu.be/9Hn

	and case selection for Class I composite restorations.				e lectu re/ SGD		K8x0cLW8?si=D9wRDUfek6p60r0c
	Explain conservative cavity design principles for posterior adhesive restorations.		C2	A1	Inter activ e lectu re/ SGD	MC Qs	https://www.youtube.com/watch?v=cf3yLMY?si=1DjQxMSSeOg2hnxy
	Explain polymerization shrinkage and C-factor in posterior composites.		C2	A1	Inter activ e lectu re/ SGD	MC Qs	https://www.youtube.com/watch?v=xZMc39Aak?si=tEoMicUvySh06nr
	Discuss finishing, polishing, and occlusal adjustment protocols to optimize restoration longevity.		C2	A1	Inter activ e lectu re/ SGD/ CBL	MC Qs	https://www.youtube.com/watch?v=nAdpz80?si=cDZ-xcsXTwcX-wod
	Describe common clinical complications (e.g., postoperative sensitivity, marginal leakage, open contacts, overhangs) and discuss preventive strategies.		C2	A2	Inter activ e lectu re/ SGD	MC Qs	https://www.youtube.com/watch?v=IrRtiTEg75s?si=Jg=nLjWOKctn2teI

PRE-CLINICAL PROSTHODONTICS							
CODE	SPECIFIC LEARNING OUTCOMES	TOPIC	COGNITIVE	ATTITUDE	MI T	A T	VIDEO LINK
DMPD2 - PD-001	Define vertical and horizontal jaw relations.	Establishing Artificial Occlusion	C1	A1	Interactive lecture/SGD	MC Qs	https://youtu.be/IpvqVBbo5x0?si=yP4N8EQ7FwOkcdY
	Enlist following features of natural occlusion: • Overjet • Overbite • Centric relation • Maximum intercuspation • Condylar guidance, and Incisal guidance		C1	A1	Interactive lecture/SGD	MC Qs	https://youtu.be/nNaPlxEQY48?si=Cvmh7oJBuOpR0rMX
	Define significant planes for arrangement of teeth: • Faciolingual, • Mesiodistal, • Occlusal plane, • Ridge relation, and		C1	A1	Interactive lecture/SGD	MC Qs	https://youtu.be/cR5UgoPSM_k?si=nxnezwikiX61MF6Xy

	Rotational curve						
	Define anatomic occlusion in artificial dentition.		C1	A1	Interactive lecture/SGD	MC Qs	https://youtu.be/SnpVNIyR8JI?si=bhDIkDbCd9TkrPuv
	Correlate features of natural occlusion with artificial dentition.		C4	A1	Interactive lecture/SGD	MC Qs	https://youtu.be/SDZW8CmS610?s_i=NZjQ4QN71XxgtL5L

PRACTICAL / LAB WORK

SCIENCE OF DENTAL MATERIALS

CODE	SPECIFIC LEARNING OUTCOMES	TOPIC	COGNITIVE	ATTITUDE	MIT	AT	VIDEO LINK
DMPD2-DM-007	Manipulate GIC as luting/lining or base consistency.	Manipulation techniques for Dental Cements	P3 / C3	A2	Demonstration / Hands-on	OSCE/OSPE/OSVE	https://youtu.be/6dNEPbl0-Xs?si=VXRR8uuyyGAFy-lz
	Mix Zinc phosphate dental cement as luting or base consistency.		P3 / C3	A2	Demonstration / Hands-on	OSCE/OSPE/OSVE	https://youtu.be/zYrmnatv5vY?si=0F-7J943T1u fM33
	Manipulate Zinc Oxide Eugenol dental cement		P3 / C3	A2	Demonstration / Hands-on	OSCE/OSPE/OSVE	

	Mix Calcium hydroxide (two paste) dental cement as pulp capping agent		P3 / C3	A2	Demonstration / Hands-on	OSCE/OSPE/OSVE	
DMPD2-DM-008	Perform trituration with correct mercury-alloy ratio. Also demonstrate condensation, burnishing, finishing and carving.	Dental amalgam	P3 / C3	A3	Demonstration / Hands-on	OSCE/OSPE/OSVE	https://youtu.be/5CXhFocUKTM?si=UZ6Jq9Tdmquwhfi6

OPERATIVE DENTISTRY

CODE	SPECIFIC LEARNING OUTCOMES	TOPIC	COGNITIVE	ATTITUDE	MIT	AT	VIDEO LINK
DMPD2-OD-005	Prepare Class I cavity on typodont for an amalgam restoration (premolars & mandibular molars).	Class I Cavity Preparation for Amalgam	P3 / C3	A2	Demonstration / Hands-on	OSCE/OSPE/OSVE	https://youtu.be/prOP05wL4zM?si=z3xKjBK21uiAu37x
	Demonstrate preparation of a Class I cavity on maxillary molars of typodont.		P3 / C3	A2	Demonstration / Hands-on	OSCE/OSPE/OSVE	https://youtu.be/prOP05wL4zM?si=Gratd06SMOKkvW7U
DMPD2-OD-006	Apply liners & bases in a prepared cavity.	Pulp protection	P3 / C3	A2	Demonstration / Hands-on	OSCE/OSPE/OSVE	https://youtu.be/g8Hr3-IQ6to?si=kQXE07ghYmeDm3da
DMPD2-OD-007	Perform trituration, condensation, carving, and finishing of amalgam restoration in prepared Class I cavity on a typodont.	Class I Restoration with amalgam	P3 / C3	A2	Demonstration / Hands-on	OSCE/OSPE/OSVE	https://youtu.be/IV5s0BXKelQ?si=r0gCVnlnbCslm9j0
DMPD2-OD-008	Perform quadrant isolation with rubber	Quadrant Isolation	P3 / C3	A2	Demonstration / Hands-on	OSCE/OSPE/OSVE	https://youtu.be.com/shorts/Uo4-

	dam for posterior composite restorations				Hands-on		zNEpYHs?si=Q_tE0RLuf8HXEONV
DMPD2-OD-009	Prepare conservative Class I cavity on typodont for composite restoration.	Cavity preparation for class I composite restoration	P3 / C3	A2	Demonstration / Hands-on	OSCE/OSPE/OSVE	https://youtu.be/9HnK8xOcLW8?si=vhjLSnaWencWNbm
DMPD2-OD-010	Demonstrate adhesive protocol, including: i. Etching strategy (total-etch/self-etch) ii. Primer and bonding application iii. Solvent evaporation and light curing	Adhesion and composite restoration	P3 / C3	A3	Demonstration / Hands-on	OSCE/OSPE/OSVE	https://youtu.be/2inYI3BuADM?si=QffzF0qyrm972oSq
	Place composite using appropriate incremental techniques to minimize shrinkage stress and establish proper contour and contact.	Adhesion and composite restoration	P3 / C3	A3	Demonstration / Hands-on	OSCE/OSPE/OSVE	https://youtu.be/EqkDQY-g_w?si=SvXQcTzaBx3ddZV
DMPD2-OD-011	Finish and polish restorations while maintaining marginal integrity and anatomy.	Finishing and Polishing	P3 / C3	A2	Demonstration / Hands-on	OSCE/OSPE/OSVE	https://youtu.be/fad108koEBU?si=ycPci3TgSLuXV1vN
	Evaluate and adjust occlusion to ensure proper functional contacts.		P3 / C5	A3	Demonstration / Hands-on	OSCE/OSPE/OSVE	https://youtu.be/9h_v9KLi mik?si=9LA3GaVKTzFiQG4n

PRE-CLINICAL PROSTHODONTICS							
CODE	SPECIFIC LEARNING OUTCOMES	TOPIC	COGNITIVE	ATTITUDE	MIT	AT	VIDEO LINK
DMPD2-PD-001	Prepare an edentulous cast suitable for the fabrication of a complete denture.	Preparation of Edentulous Cast	P3 / C3	A2	Demonstration / Hands-on	OSCE/OSPE/OSVE	https://youtu.be/t8ZVGSrSuUY?si=W0uLQDWLnV6UYvk8
	Identify anatomical landmarks on edentulous cast.		P1 / C4	A2	Demonstration / Hands-on	OSCE/OSPE/OSVE	https://youtu.be/9cOmSlaDvxU?si=J1TzSeBxX9wSJjHB
DMPD2-PD-002	Perform wax-up of trial denture upper base plate ensuring recommended extension and denture base adaptation.	Wax-Up of Upper Base Plate	P3 / C3	A2	Demonstration / Hands-on	OSCE/OSPE/OSVE	https://youtube.com/shorts/15wpTn3GdvY?si=8zqQ1H9cdR1U3KwB
DMPD2-PD-003	Perform wax-up of trial denture lower base plate ensuring correct border extension and stability.	Wax-Up of Lower Base Plate	P3 / C3	A2	Demonstration / Hands-on	OSCE/OSPE/OSVE	https://youtube.com/shorts/nTGNzT7gck?si=522L5zgwbdpEt9dr
DMPD2-PD-003	Demonstrate correct procedure for flasking trial denture upper and lower base plates prior to processing.	Flasking of Upper and Lower Base Plates	P3 / C3	A2	Demonstration / Hands-on	OSCE/OSPE/OSVE	https://youtu.be/vowbYucpIgQ?si=1uZsGhk549fxln2q

DMPD2- PD-004	Perform dewaxing for trial denture upper and lower base plates.	Dewaxing of Upper and Lower Base Plates	P3 / C3	A2	Demonstration / Hands-on	OSCE/OSPE/OSVE	https://youtu.be/8cZXWUyQj4s?si=plA4nmfPO323z94
DMPD2- PD-005	Perform packing, curing, and finishing of trial denture base plates, ensuring smooth and well-adapted surfaces.	Packing, Curing, and Finishing of Base Plates	P3 / C3	A2	Demonstration / Hands-on	OSCE/OSPE/OSVE	https://youtu.be/8u0Y2MtpAWs?si=SzkaVbu6KtRGLqoc



PRISME

DEPARTMENT OF DENTAL EDUCATION

PROFESSIONALISM	
Year	Learning Outcomes (LOs)
II	• Utilize effective communication techniques with dental patients while history taking. • Develop rapport with patients using rapport building steps. • Enhance emotional literacy in handling pediatric & adult dental patients.

RESEARCH	
Year	Learning Outcomes (LOs)
II	• Identify referencing styles & use referencing software (Vancouver) • Submit structured literature review (portfolio task) • Design the basic framework of an epidemiological study relevant to dental public health. • Apply techniques such as randomization and blinding to minimize bias in studies.

INFORMATICS	
Year	Learning Outcomes (LOs)

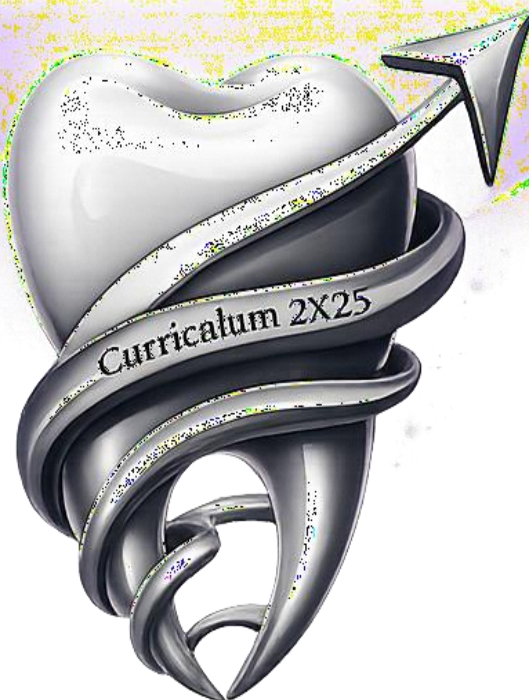
SOCIAL RESPONSIBILITY, CULTURAL SENSITIVITY, ETHICS & JURISPRUDENCE	
Year	Learning Objectives
II	• Develop empathy and cultural competence. • Manage patient anxiety during procedures • Explore psychological responses to dental-related illnesses. • Apply SPIKES protocol in delivering bad news. • Maintain professional boundaries with patients. • Manage patient expectations regarding dental procedures.
II	• Apply citation managers (Zotero/Mendeley/EndNote)

MANAGEMENT & ENTREPRENEURSHIP	
Year	Learning Objectives
II	• Collaborate effectively with dental laboratory technicians to ensure accurate fabrication and timely delivery of restorative and rehabilitative appliances. • Execute assigned tasks within time limits using planning strategies.

EVIDENCE BASED DENTISTRY	
Year	Learning Objectives
II	• Apply basic behavior-change models (e.g., Health Belief Model) to design patient education

C-FRC

Clinical Foundation Rotation Clerkships



CFRC

DEPARTMENT OF DENTAL EDUCATION

 1.	History Taking Demonstrate the process of history taking for dental caries, including eliciting relevant risk factors, symptoms, and patient concerns.
2.	Tooth Charting and Numbering Accurately chart and record teeth using different dental numbering systems (Universal, FDI, Palmer) in diagrams.
3.	Fluoride Application Perform topical fluoride application on a typodont, or phantom head.
4.	Patient and Operator Positioning Demonstrate correct patient and operator positioning for extraoral and intraoral examination.
5.	Extraoral Examination Perform extraoral examination of the face & neck (inspection, palpation, lymph node check) on a simulated patient or peer.
6.	Intraoral Examination Demonstrate intraoral examination techniques using a mouth mirror, explorer, and probe on a typodont or peer.
7.	Plaque Disclosure Technique Demonstrate correct application of disclosing agent and record plaque distribution accurately.



RAHBAR COLLEGE
OF DENTISTRY

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>

	→ Rotate discussion leadership among students each session → Close with a structured summary linking SGD to LOs and assessment
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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	→ Ensure teams are formed before the first TBL session with pre-reading assigned → iRAT: 10 questions, 10 minutes; tRAT: same questions, scratch-card format → Application exercises must be clinically relevant to dentistry → Award team points; display leaderboard to motivate participation

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> → <i>Provide a structured problem template with defined opening and closing sessions</i> → <i>Assess individual and group contributions separately</i>

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
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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	→ <i>Distribute self-study questions one week in advance</i> → <i>Begin with brief MCQ quiz (5 questions) to gauge prior knowledge</i> → <i>Focus tutorial time on areas where most students struggled</i> → <i>End with "muddiest point" card for anonymous feedback to faculty</i>

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	→ <i>Introduce a structured reflection framework (e.g. Gibbs, DEAL) in orientation</i> → <i>Provide a reflective writing template with guided prompts</i> → <i>Provide formative written feedback; do not grade solely on style</i> → <i>Share anonymised exemplary reflections to model good practice</i>

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	→ <i>Provide a curated SDL resource list aligned to each week's LOs</i> → <i>Set 2–3 self-assessment MCQs per SDL week for formative practice</i> → <i>Incorporate SDL-based questions in block examination papers</i> → <i>Encourage use of Anki, Khan Academy Health, PubMed and UHS e-library</i>

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	→ <i>Brief students comprehensively on observation objectives before each rotation</i> → <i>Pair each student with a clinical supervisor for each CFRC session</i> → <i>Require students to complete structured observation forms after each session</i> → <i>Debrief as a group after CFRC; link observations to relevant Block 2 Los</i>



RAHBAR COLLEGE
OF DENTISTRY

Assessment



DEPARTMENT OF DENTAL EDUCATION



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

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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

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papers and keys for the Block/Clinical Clerkship examination, within two weeks of completion of each Blocks/Clinical Clerkships examination.

Further, parent-teacher meetings shall be arranged by the colleges after every Block/Clinical Clerkship examination to share feedback on the progress of students with their parents. Minutes of parent teacher meetings, academic timetables/schedule of Blocks/Clinical Clerkships and academic year study guides shall be submitted to the Department of Medical Education UHS, as well.

11. It is emphasized that fresh internal assessment or a revision of assessment for supplementary examination shall not be permissible. However, a revised internal assessment for the detained students can be submitted. The internal assessment award in a particular year will not be decreased subsequently

detrimental to the detainee candidate. A proper record of the continuous internal assessment shall be maintained by the concerned department/s in the colleges.

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

Block/Clinical Clerkship Attendance	Remedial Classes
<75%, ≥ 50% (50-74%)	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
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13. The following policy shall be applicable for transition of students From Traditional Subject-Based Scheme to the Modular Integrated Curriculum Scheme:

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



BDS 2nd Year, BLOCK-05

Sr. No.	Written Exam				Oral/Practical exam			Total
	Modules	Subjects	No. of MCQs	Total MCQs	Subjects	OSPE/ OSCE (9 marks)	OSVE (6 marks)	
1	Endocrinology	Physiology	10	22	Physiology	-	01	06
2		Biochemistry	6		Biochemistry	-	01	06
3		General Pathology & Microbiology	3		Oral Biology & Tooth Morphology	01	01	15
4		Pharmacology & Therapeutics	3		Prosthodontics	01	01	15
5	Occlusion-II	Oral Biology & Tooth Morphology	13	20	Community & Preventive Dentistry	01	01	15
6		OMFS	2		Behavioral Sciences	01	01	15
7		Periodontology	2		Operative Dentistry	01	01	15
8		Prosthodontics	2		Science of Dental Materials	01	01	15
10		Orthodontics	1		PRISME	01	-	09
11	Community Dentistry & Public Health-II	Community & Preventive Dentistry	11	30	CFRC	01	-	09
12		Behavioral Sciences	19		-	-	-	-
16	Dental Materials & Pre-Clinical Dentistry-II	Operative Dentistry	11	46	-	-	-	-
17		Prosthodontics	10		-	-	-	-
18		Science of Dental Materials	25		-	-	-	-
19	PRISME		02	02	-	-	-	-
Total				120	Total	8 OSPE= 72 marks	8 OSVE= 48 marks	120



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Learning Resources

Learning resources



Subject	Learning Resources
General Anatomy, Histology & Embryology	1. General Anatomy by Laiq Hussain Siddiqui 7th Edition 2. Medical Histology Text and Atlas by Laiq Hussain Siddique 9th Edition 3. Langman's Medical Embryology 15th Edition 4. Snell's Clinical Anatomy by Regions 11th Edition 5. Snell's Clinical Neuroanatomy 9th Edition
Physiology	6. Guyton & Hall. Textbook of Medical Physiology (14th ed.). 7. Essential Physiology for Dental Students (Essentials (Dentistry)) 1st Edition by Kamran Ali (Editor), Elizabeth Prabhakar (Editor)
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. Fuller, J. L. (4th ed.). Concise Dental Anatomy & Morphology. 3. Nelson, S. J. (2015). Wheeler's Dental Anatomy, Physiology and Occlusion (1st SAE) (for Occlusion).
General Pathology & Microbiology	1. Robbins & Cotran Pathologic Basis of Disease 2. Review of Medical Microbiology and Immunology by Levinson
Community & Preventive Dentistry	1. Textbook of Public Health Dentistry by SS Hermith
Pharmacology & Therapeutics	1. Katzung & Trevor's Pharmacology Examination & Board Review (12th ed.)- Mini 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
Behavioral Sciences	1. Hand book of Behavioral sciences, by MH Rana, 3rd ed. 2. Humayun A., Herbert M. (2010). Integrating behavioural sciences in healthcare. Islamabad: HEC.
Periodontology	1. Newman and Carranza's Clinical Periodontology (3 rd South Asia Edition)
Oral Medicine	1. Tyldesley's Oral Medicine (5th Edition)
Dental Radiology	1. K. Horner, K. A. Eaton's Selection Criteria for Dental Radiography (3 rd 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)