RAHBAR COLLEGE
OF DENTISTRY

RAHBAR COLLEGE OF DENTISTRY

SECOND YEAR
STUDY GUIDE 2026

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RCoD LAHORE

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.

INTRODUCTION TO STUDY GUIDE

As you enter the second year of your Bachelor of Dental Surgery (BDS) program, this study guide is designed to help you navigate this crucial stage of your education. It focuses on consolidating your knowledge, enhancing clinical skills, and preparing you for your future career in dentistry.

Objectives of Second Year:

1. **Integration of Knowledge**: Reinforce and integrate the knowledge gained in previous year across all disciplines, including anatomy, physiology, biochemistry, and oral biology & tooth morphology.
2. **Preclinical Proficiency**: Develop your proficiency in preclinical exercises, including cavity preparation, and prosthetic work on models. This helps you to prepare for clinical application in upcoming years.
3. **Professional Development**: Enhance your understanding of the ethical, legal, and professional responsibilities of a dentist. Prepare for the transition from student to practitioner.
4. **Exam Preparation**: Equip yourself with effective study strategies and resources to excel in final examinations and assessments.

CORE SUBJECTS IN SECOND YEAR

1. Community and Preventive Dentistry
2. Science of Dental Materials
3. General Pathology and Microbiology
4. Pharmacology
5. Behavioural Sciences
6. Preclinical Operative Dentistry
7. Preclinical Prosthodontics

Additional Modules

Additional subjects enhance the core curriculum, offering specialized knowledge, skills, deepening understanding and proficiency in related fields:

1. Generic competencies
2. Research

ABBREVIATIONS

1. ART: Atraumatic Restorative Treatment
2. **BDS**: Bachelor of Dental Surgery
3. **CBD**: Case-based discussion
4. **LGIS**: Large Group Interactive Session
5. **MIT**: Mode of Information Transfer
6. **OMFS**: Oral and Maxillofacial Surgery
7. **OSCE**: Objective Structured Clinical examination
8. **OSPE**: Objective Structured Practical examination
9. **SAQ**: Short Answer Question
10. **SDL**: Self Directed Learning
11. **SEQ**: Short Essay Question
12. **SGD**: Small group discussion
13. **SOP**: Standard Operating Procedure

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GENERAL GUIDELINES

- All lectures and tutorials will be conducted in one specific room allotted to your year.
- Students must follow the disciplinary guidelines laid down by the administration.
- Institutional Dress Code must be followed by all students.
- All students must wear white overalls in class.
- All students are required to wear their issued identity/student cards in class.
- The students will be required to maintain their subject logbooks and get them duly signed and checked. Any breach of discipline in the class will not be tolerated.
- Mutual respect for both genders is to be strictly observed.

RATIONALE OF CURRICULUM

The rationale for curriculum is to equip future dentists with the knowledge, skills, and attitudes necessary to provide high-quality oral healthcare to patients. Student-centered teaching methodology is employed in the curriculum, to ensure that the graduates are competent, compassionate, and ethical professionals, who can contribute to the overall health and well-being of society.

- **Globally competent graduates:** The dental curriculum ensures teaching students the necessary clinical and interpersonal skills which are at par with the global level, thus ensuring their state-of-the-art expertise with convenient employment opportunities.
- **Student's engagement through integrated teaching**: Students are actively engaged in learning through preclinical sessions, case-based learning, simulations, and clinical exposures, during foundation years. The continuous horizontal and vertical integration allows them to develop their ability to analyze complex information, interpret evidence, and make informed decisions. Spiral curriculum approach enhances the retention of the core principles while learning latest advancements.
- **Patient-centered approach:** Students develop a patient-centered perspective, emphasizing empathy, communication, and collaboration with a team-based learning approach. Graduates are better prepared to provide high-quality patient care due to their strong clinical skills and critical thinking abilities.
- **Real-world experience:** Students gain valuable experience through clinical rotations and simulations, preparing them well, as per the requirements of professional practice. The comprehensive care dentistry clinic provides them with a real-world scenario in a well supervised learning environment, thus ensuring efficient training.
- **Adaptability to changing healthcare landscape through research and innovation:** A student-centered curriculum shall be adapted to address evolving healthcare needs and advancements. Students are encouraged to think creatively and develop innovative solutions to overcome healthcare challenges.
- **Lifelong learning:** A student-centered approach fosters a culture of lifelong learning, essential for healthcare professionals, staying up to date with the latest advancements in

dental science and technology. The drive to conduct research and scientific breakthroughs shall make them leaders in practice.

To achieve these objectives, this dental curriculum includes a combination of classroom instructions, laboratory work, pre-clinical & clinical experience, and research opportunities. The student-centered curriculum provides a robust foundation for developing competent, compassionate, and adaptable healthcare professionals. By empowering students to take ownership of their learning and apply their knowledge to real-world scenarios, this approach equips them well to meet the challenges of an ever-changing healthcare landscape and deliver high-quality patient care.

INTRODUCTION TO CURRICULAR FRAMEWORK

This study guide is developed as a resource material for the students and faculty. The study guide development process included representation from teaching faculty and students. The study guide aims to ensure alignment between societal, institutional, patient, and student needs. The curriculum implemented is a hybrid type of curriculum that has both horizontal and vertical integration via logical sequencing.

The curriculum comprises the following two phases:

PHASE 1 (1 & 2 Year): Includes teaching of basic sciences namely: Anatomy, Physiology, Biochemistry, Oral Biology & Tooth Morphology, Science of Dental Material, Pharmacology, Community & Preventive Dentistry, General Pathology & Microbiology and Behavioural Sciences. It also includes initial training of pre-clinical Prosthodontics, pre-clinical Operative Dentistry, and Research.

PHASE 2 (3rd& Final Year): Includes teaching and training in Periodontology, Oral Pathology, Oral Medicine, General Medicine, General Surgery, Oral and Maxillofacial Surgery, Prosthodontics, Orthodontics, Operative Dentistry, Paediatric Dentistry, Comprehensive Care Dentistry and Research.

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CURRICULUM MAP

Academic Year	Orientation	Instructional strategies	Learning Outcome	Block 1 Block-1 Exam	Block 2 Block-2 Exam	Block 3 Block-3 Exam	Formative & Summative Assessment	Internal Assessment	Send Up	Professional Examination
Year 1	Orientation Week	• Interactive Lecture • SGDs • CBL/ Assignments • Chairside/ bedside Teaching • Practicals • SDL	**Knowledge** **Skill** **Attitude**	**Examinable Subjects:** Anatomy + Physiology + Oral Biology + Biochemistry + Islamic and PakistanStudies **Non-Examinable Subjects:** None			**Cognitive:** MCQ, SEQ, Viva **Psychomotor:** OSPE, OSCE Practical, Logbook. **Affective:** DOPs, OSCE Viva, Logbook	Block Result + Attendance +Generic Competencies+ Research + Send-up = 10%	MCQs/SEQs/OSPE/OSCE/Viva Voce	CQs/SEQs/OSPE/OSCE/Viva Voce
Year 2				**Examinable Subjects:** Pathology + Pharmacology + Dental Materials + Community Dentistry + Behavioural Sciences **Non-Examinable Subjects:** Pre-Operative + Pre-Prosthodontics						
Year 3				**Examinable Subjects:** General Medicine + General Surgery + Oral Pathology + Oral Medicine **Non-Examinable Subjects:** Operative Dentistry + Prosthodontics + Oral and Maxillofacial Surgery						
Year 4				**Examinable Subjects:** Operative Dentistry + Prosthodontics + Oral and Maxillofacial Surgery + Orthodontics **Non-Examinable Subjects:** None						
Timetable= **Course duration**: 4-year **Timings:** 8 am to 3 pm			Venues: lecture halls, Skill lab, Dental Clinics, Wards, Tutorial room, Conference room Learning Resources: Textbook, Study Models, Case Records, Histology Slides, Dental Material & Instruments							

RCoD PROGRAM OUTCOMES AND COMPETENCIES

Bachelor of Dental Surgery (BDS) will have the following program outcomes at RCoD.

- The dental graduates will demonstrate the knowledge and skills necessary to practice dentistry in primary care settings to provide comprehensive patient care and make independent decisions for their patients.
- The graduates will promote dental health care within the community, utilizing the latest research, critical thinking and professionalism.
- The graduates will exhibit emotional intelligence, commit to lifelong learning, who can demonstrate leadership and foster innovation.

RCoD aims to produce a dental graduate to achieve the following competencies, as outlined by PM&DC.

Generic Competencies

1. Professionalism
    - Communication skills
    - Time management
    - Ethics & integrity
    - Teamwork
    - Problem-solving skills
    - Empathy in patient care
2. Critical thinker
3. Creativity - Innovation
4. Leadership
5. Emotional intelligence
6. Life-long learner

Specialty Oriented Competencies (Knowledge, Skill, Attitude)

1. Researcher
2. Emergency patient management
3. Comprehensive care dentistry
4. Implant dentistry
5. Operative dentistry and endodontics
6. Prosthodontics
7. Periodontics
8. Oral and maxillofacial surgery
9. Orthodontics
10. Oral medicine and radiology
11. Paediatric dentistry
12. Pain and anxiety management
13. Health promotion within the community

TEACHING METHODOLOGIES

The learning will be through diverse methods and will include:

1. Large Group Interactive Session (LGIS)
2. Small Group Discussion (SGDs) including Tutorial
3. Case-Base Learning (CBL)
4. Practical
5. Self-Directed learning (SDL)
6. Chairside teaching
7. Reflective Writing

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Timetable 2nd Year BDS Session Jan 2026-Dec 2026

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DAY / DATE	08:00 - 08:50	08:50 - 09:40	09:40 - 10:45	10:45 - 10:55	10:55 - 11:45	11:45 - 02:00	02:00 - 03:00
MONDAY	General Pathology Lecture 50 mins	Pharmacology Lecture 50 mins	Behavioral Sciences Lecture 65 mins	Break 10 mins	Community Dentistry Lecture 50 mins	Community Dentistry Practical / SGD 135 mins	Community Dentistry Research Module 60 mins
TUESDAY	8:00 - 8:45. General Pathology Lecture 45mins	8:45 - 9:30 Pharmacology Lecture 45 mins	9:30 - 10:55 Dental Material Lecture 55 mins / Case discussion 30 mins	10:55 - 11:05 Break 10 mins	11:05 - 01:10 Pathology Practical (Batch A) / Pharmacology Practical (Batch B)/ SGD 125 mins	01:10 - 02:00 Community Dentistry Lecture 50 mins	02:00 - 03:00 General Pathology Lecture 60 mins
WEDNEDAY	8:00 - 9:20 Dental Material Lecture (Integrated with Prosthodontics) 80 min	09:20 - 11:35 Preclincial Prosthodontics (Batch A)/ Operative Practical (Batch B) 135 mins		11:35 - 1:35 Pathology Practical (Batch B) / Pharmacology Practical (Batch A) 125 mins		1:35 - 2:00 Break 25 mins	02:00 - 03:00. Pharmacology Lecture 60 mins
THURSDAY	8:00 - 9:10 Dental Material Lecture (Integrated with operative) 70 mins	09:10 - 11:25 Preclinical Prosthodontics (Batch B) /Operative Practical (Batch A) 135 mins	11:25 - 11:55 Behavioral Sciences 30 mins	11:55 - 12:35 General Pathology Lecture 40 mins	12:35 – 12:45 Break. 10 mins	12:45 - 2:00 Behavioural Sciences. (Integrated with Clinical Sciences) 75 mins	02:00 - 03:00 Dental Materials 60 mins
FRIDAY	08:00 - 08:40 Community Dentistry Lecture 40 mins	08:40 - 09:40 Dental Materials Lecture 60 mins	9:40 - 10:30. Pharmacology Lecture 50 mins	10:30 - 1:00 Dental Material SGD/ Practical 75 min /Tutorial 75 mins	01:00 - 01:20 Jumma Break 20 mins	1:20 - 2:00 Pharmacology Lecture 40 mins	02:00-03:00 General Pathology Lecture 60 mins

Copy for information to the:

1. Vice Principal RMDC
2. Director Admin. RCoD
3. Concerned Head of Departments, RCoD
4. Deputy Director Admin, RCoD
5. Department of Dental Education, RCoD
6. IT Incharge, RCoD
7. Computer Cell, RCoD
8. StudentAffairs, RCoD
9. Notice Board, RCoD
10. Class Representative (Boys/Girls)

No. 102/RCoD/13 Dated: 6/8/2024

SUBJECTS	Mint per Week	Total Credit Hours Achieved	Total Credit Hours PMDC
Pathology	380	228	220
Pharmacology	370	222	220
Dental Materials	505	303	300
Preclinical Prosthodontics	135	81	80
Preclinical Operative Dentistry	135	81	80
Behavioral Sciences	170	102	100
Community & Preventive Dentistry	335	201	200

Dr. Sadaf Munir
Assistant Prof/HOD (Gen. Path)
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Prof. Hina Zafar Raja
Head of Prosthodontics Department
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Dr. Saad Ullah
Assisistant Prof. (Dental Material)
Rahbar College of Dentistry, Lahore

Prof. Nasir Saleem
Principal, Rahbar College of Dentistry, Lahore

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TEMPORAL ALIGNMENT TABLE

Week	Pharmacology	Pathology	Dental Materials	Community Dentistry	Behavioural Sciences
1	Introduction to Pharmacology; Routes of drug administration; Pharmacokinetics; Biotransformation	Introduction to Pathology; Cell injury and cellular adaptations; Introduction to Microscope	Introduction and classification of dental materials and structure of matter	Intro to CD; Concepts of health*, Disease*, Ergonomics	Introduction to Behavioral Sciences, Holistic vs. Traditional Allopathic medicine, Bio-psycho-social model of health and disease, Integrated Model of Health Care, The Public Health Care Model, Health Belief Model
2	Pharmacodynamics; Dose response curves of agonist & antagonist; Weight & measures	Gram staining; Necrosis and apoptosis; Intracellular accumulation; * Calcification and Hyaline change*	Physical properties of dental materials (Rheological, electrical, thermal and optics)	Disease, Screening for disease, History taking & examination	Non-pharmacological Interventions (Communication skills, Counselling, Informational Care, Handling Difficult Patients and Their Families)
3	Introduction to ANS receptors Antiulcer drugs Antiemetics Antidiarrheal drugs*, Laxatives*, Carminative mixture Sulphur ointment	Introduction to Inflammation and Chemotaxis	Mechanical properties of dental materials	Infection*, Intro & classification of oral diseases, PHP, History taking & examination	Non-pharmacological Interventions (Breaking Bad News, Crisis Intervention and Disaster Management, Conflict Resolution) Empathy
4	Classifications of drugs acting on ANS*, Cholinergic drugs Anticholinergic drugs Organophosphate poisoning & its treatment Effect of acetylcholine & atropine on rabbit ileum	Morphological patterns and outcomes of acute inflammation; Chronic inflammation, Healing & Repair: introduction* healing by primary & secondary intention, factors affecting wound healing, complications of wound healing	Biocompatibility of dental materials	Ethical Issues	Medical/Dental Ethics, Scope and meaning, Guiding principles, Common Ethical Issues and Dilemmas
5	Classifications*, Sympathomimetic drugs; alpha-1 agonists,alpha2 agonist,beta2 agonist,Epinephrine,Norepinephrine,Dopamine, Dobutamine,	Haemodynamics, oedema, Haemorrhage, Haemostasis, Thrombosis, Necrosis, Infarction, Fatty changes, Chronic	Impression materials Elastic (Hydrocolloids, elastomers); Non-elastic (impression compound, waxes, impression plaster, impression paste)	Deans Fluorosis index, Health need assessment*, Oral Hygiene Instructions	Doctor-patient relationship, Rights and responsibilities of patient and Doctors

		venous congestion, Embolism, and Shock			
6	Alpha blockers Beta blockers Treatment of Glaucoma	Genetics introduction*,Syndromes,mutation,diagnosis of genetic disorders,Introduction to microbiology; Bacterial structure; Inoculation of specimens*	Gypsum products Manufacturing, setting reaction, manipulation and use	Mobility & Malocclusion index;CPITN,Flossing techniques	Psychological Reactions in Doctor-Patient Relationship, Professionalism in Healthcare
7	Anticoagulants, Antiplatelet drugs, Treatment of hyperlipedemia, Antihistamines, Treatment of anemia* Castor oil emulsion Reinforcement	Bacterial growth; Culture media*; Bacterial genetics*	Waxes composition, setting reaction, manipulation and use	WHO assessment form,Nutrition*,Diet & Oral Manifestations,Environment & Health	Role of Psychology in Medical/dental practice
8	Antihypertensive drugs; Diuretics; Vasodilators; Ca channel blockers, ACE inhibitors, ARB's Alpha-2 agonist, Alpha blockers, Beta blockers	Normal Flora; Sterilisation; Urine analysis*; Instruments*	Casting Investment, composition, use and setting reaction	Waste Management & Disposal, Occupational hazards, Levels of prevention; Preventive services; Prevention of Oral disease), DMFT	Principles of Psychology (Learning and Memory)
9	Reinforcements, Formative viva General Pharma, GIT, ANS.	Pathogenesis of bacteria; Mode of action of antimicrobials*; Mode of resistance of antimicrobials*	Casting procedures and defects associated	Public health services and problems,ethical principles biodental decision-making and research, DMFT	Perception and Thinking
10	Treatment of acute & chronic heart failure Treatment of Angina,Antiarrhythmic drugs* Antihyperlipidemic drugs	Sp Bacteriology: Streptococci,Staphylococci,Clostridium, Bacillus*, corynebacterium	Reinforcement	Intro to Epidemiology,Tobacco and its restriction,Oral cancer and other conditions of oral diseases,Tooth brushing techniques	Emotions and Motivations
11	Treatment of asthma Treatment of Tuberculosis, Antitussive drugs*	Immunology: Cell mediated immunity, Humoral immunity, Complement system,	Dental Polymers (crystallinity, plasticizers, types of polymerization reaction)	Intro to Epidemiology of oral diseases; Terminologies,causality and risk ,examiner reliability and ethical considerations,Epidemiological methods & study designs(Descriptive)	Intelligence
12	Corticosteroids, Treatment of anaphylaxis,Treatment of migraine.	Hypersensitivity type I, II, III and IV; Transplantation; immunodeficiency	Denture Base Resin (Types of resins, techniques, classification,	Epidemiological methods & study designs (Analytical, Bias, Matching)	Personality Development

	Pharmacy practical	(Primary*, secondary) Tolerance and Autoimmunity; Vaccines and cytokines	composition and manipulation)	Pit & Fissure sealants	
13	NSAIDs, Opioid analgesics, Pharmacy practicals	Neisseria; campylobacter and helicobacter*. vibrio. Pseudomonas. Neisseria*	Bonding and bonding mechanism (generations of bonding agents, adhesion and contact angle, acid etching, steps)	Epidemiological methods & study designs (Experimental ,report writing),ART	Sleep and Arousal
14	Sedative & hypnotic drugs,Antidepressants, Antipsychotics	Shigella, Salmonella	Composite resin (Types, composition, use, manufacturing and manipulation)	Epidemiology of dental caries & periodontal disease and their prevention,Plaque disclosing agent	Psychosocial Aspects of health and disease (health and normality, defence mechanisms)
15	Local anaesthetics, General anaesthetics, Epilepsy, Antiparkinson drugs.	Mycobacterium tuberculosis, M.leprae*	Dental Cements (Intermediate restorative materials, compositions, use, advantages and disadvantages of all cements)	Epidemiology & aetiology of Oral cancer, malocclusion, orofacial defects, trauma and accidents and their prevention,Topical Fluorides	Psychosocial Assessment in Health-care, Comprehensive psycho-social assessment, Psychological reactions to illness and hospitalisation
16	Revision topics block1 and practicals revision	H.influenza; Virology: Mumps and Measles, smallpox. Chicken pox	Dental Cements (compositions, use, advantages and disadvantages of all cements)	Reinforcement & assessment of online topics,Mock OSPE	Psycho-social assessment, Interviewing/ History-taking
17	Revision	Revision	Dental Cements (compositions, use, advantages and disadvantages of glass monomer cements)	Biostatistics,terminologies,Data,Variable,methods of data collection,methods of data presentation, Tooth discoloration	Psychosocial issues in special hospital settings
18	Revision	Revision	Dental Amalgam: Classification, setting reactions, metallurgical phase, manipulation, use, clinical considerations	Biostatistics, Measures of central tendency, Measures of Dispersion, Normal Distribution, Confidence, Probability, Test of significance, Disinfection of dental unit	Psychosocial issues in special hospital settings
19	Introduction to chemotherapy,Cancer chemotherapy Antifungal drugs,	Neoplasia: nomenclature of tumor. Routes of spread of tumours;	Direct filling gold: Classification, manipulation, use, clinical considerations	Research Methodology; Types, Sampling, Airborne Infection; Barriers for patient &	Psychosocial peculiarities of Dentistry

	Antiviral drugs	Tumour Metastasis; Carcinogenesis*		clinician, Handwashing & PPE	
20	Antihelminthic drugs, Antiprotozoal drugs; antimalarial, antiamebic drugs;Metronidazole. Prescription wriitng	Screening of tumours and tumour markers; Proto-onco genes *and tumour suppressor genes; Grading and staging of tumours	Finishing and polishing; Types of abrasives, methods, benefits, contraindications	Research Methodology; Infection control & Sterilization, HIV AND AIDS, HEP B&C ,Public and professional perception of infectious disease, Safety and environmental issues of dental amalgam, Airborne infection, infection control & Mercury safety, clinical procedures, Sterilization, Barriers for patient and clinician, Needle stick injury & immunization	Management of Anxiety and Phobias
21	Antibacterial drugs, Cell wall synthesis inhibitors;penicillin,cephalosporin,vancomycin,beta lactamase inhibitors.	Virology: lab diagnosis* Rubella,Rota virus*,Polio Virus.adeno virus	Reinforcement	Health promotion; health education (Objectives, Principles, communication) planning a dental health education programme); School dental health, Disinfection & sterilization	Common Psychiatric Disorders
22	Protein synthesis inhibitors, Macrolides, chloramphenicol, streptogramins,Linezolid ,Tetracycline. Assignment, Prescription writing	Parasitology: Concepts and classification; Amebiasis,Giardiasis* , Trichomonas*. Plasmodium, Leishmania*	Reinforcement	Global goals for oral health, knowledge & attitudes about oral health, School dental health (Components, Incremental, comprehensive, SDH programs), Waste disposal	Common Psychiatric Disorders
23	DNA synthesis inhibitors, Sulfonamides,Fluoroquinolones, Biostatistics practical.	Parasitology revision	Introduction to Metal and alloys	Planning, Survey, Evaluation	Psychosocial Aspects of Gender and Sexuality
24	Antihelminthic drugs, Dental Pharmacology	Trypnosomes* fish and dog tapeworm, dwarf tapeworm, Ascaris, pin worm, elephantiasis	Dental Casting alloys (Base metal Alloys, composition, use, classification)	DPH, OHI, SBI, GI, bacterial Plaque index, Periodontal index; Oral Hygiene Instructions	Psychosocial Aspects of Gender and Sexuality
25	Dental Pharmacology	Virology: HSV,HPV	Dental Casting alloys	Preventive Dentistry (Plaque control,cariogenicity of	Psychosocial Aspects of Pain

			(Nobel metal Alloys, composition, use, classification)	different sugars,disclosing agents) ,DMFT	
26	Dental Pharmacology	Rabies,Influenza	Wrought alloys: Types, use, clinical use, orthodontic wires	Preventive Dentistry (caries activity test,Pit & Fissure sealants,Caries vaccine,MID) Tooth brushing techniques	Psychosocial Aspects of Aging, death and dying
27	Dental Pharmacology	Dengue fever, Coronavirus, Hepatitis A, E*, Hepatitis B,C	Dental ceramics Types, composition, metal ceramic bond and restorations,all ceramic restorations, advancements	Dental caries and other soft lesions of oral cavity,TMJ	Psychotrauma
28	Revision CNS topics	Mycology*	Dental ceramics Types, composition, metal ceramic bond and restorations,all ceramic restorations, advancements	Preventive Dentistry) (Fluorides in dentistry, Topical & systemic Fl, Toxicity)	Psychosocial Aspects of Terrorism
29	Revision Antibiotics	Systemic Pathology*: (Nutritional deficiencies, burns and radiation, diabetes, hypotension, thyroid, endocarditis hemophilia, ulcerative colitis, peptic ulcer, crohn disease)	Soldering and welding Parent metal, flux, anti flux, solder, types and use)	Health care delivery systems in Pakistan; International health agencies	Life Events (Relationship of life events with conception of illness and stress)
30	Revision antifungal,antiviral,antic ancer,antiprotozoal drugs, Prescription writing	Leukoplakia; Oral cancer, Submucous fibrosis,dental caries*,oral cyst*	Endodontic materials Cements, obturating materials, methods	Dental Auxiliaries	Stress and its Management
31	Revision topics of Dental pharmacology, Biostat practical revision	Revision. G. Pathology	Discussion/ Revision	Discussion/ Revision	Leadership in Healthcare Types of Leadership
32	Reinforcement	Revision Microbiology	Discussion/ Revision	Discussion/ Revision	Teamwork and Team Management
33	OSPE Revision/Practice	Revision-MCQs	Discussion/ Revision	Discussion/ Revision	Presentations
34	OSPE Revision/Practice	Revision-MCQs	Discussion/ Revision	Discussion/ Revision	Presentations
35	Revision General pharma,ANS,CVS, Blood	Discussion of sp. Pathology topics	Discussion/ Revision	Discussion/ Revision	Discussion/ Revision

36	Revision General pharma, ANS, CVS, Blood	Discussion of sp. Pathology topics	Discussion/ Revision	Dental Auxiliaries;Dental instruments & materials	Discussion/ Revision
37	Revision GIT, Respiratory system, Endocrinology, CNS	Revision OSPE	Discussion/ Revision	Discussion/ Revision	Discussions/ Revision
38	Revision Chemotherapy, Dental Pharmacology	Discussion/ Revision	Discussion/ Revision	Discussion/ Revision	Discussion/ Revision

RAHBAR COLLEGE
OF DENTISTRY

Department of Community & Preventive Dentistry

Study Guide

2026

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WELCOME NOTE

Welcome to the fascinating world of Community and Preventive Dentistry!

As second-year Bachelor of Dental Surgery students, you are about to embark on an academic journey that extends beyond the boundaries of clinical dentistry. This study guide aims to provide you with a comprehensive understanding of the principles and practices that are essential to improving oral health at the community level. You will explore the dynamics of public health, preventive strategies, and the impact of social determinants on oral health, all of which are fundamental to your development as a well-rounded dental professional. We hope this guide not only enhances your knowledge but also inspires you to become advocates for oral health in your communities.

Wishing you all the best in your studies!

Prof. Dr. Fahd Mehtab ud-din Dogar
Head, Department of Community and Preventive Dentistry

RATIONALE FOR THE COURSE

The significance of community and preventive dentistry lies in its focus on promoting oral health and preventing dental diseases at the population level. This field emphasizes education, awareness, and access to dental care, ultimately aiming to reduce health disparities and improve overall community well-being. By addressing the social determinants of health, community and preventive dentistry plays a crucial role in enhancing quality of life and reducing healthcare costs.

Community and preventive dentistry is closely linked to clinical science subjects by emphasizing early detection and education in oral health. For example, it informs periodontal health practices, supports early orthodontic intervention, and promotes preventive strategies in operative dentistry, ultimately enhancing overall community well-being and access to care. This interdisciplinary approach fosters a proactive model for improving oral health outcomes.

This course integrates support options such as access to laboratory facilities and comprehensive library resources to enhance hands-on learning and research skills. Innovative learning strategies, including active learning techniques and problem-based approaches, are embedded to promote critical thinking and student engagement. These elements are designed to equip students with practical competencies and foster a deeper understanding of the subject matter.

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DEPARTMENTAL DETAILS

Head of the department	Prof. Dr. Fahd Mehtab ud-din Dogar
Study guide developed by	Prof. Dr. Fahd Mehtab ud-din Dogar
Total Lectures	108
SGDs	36

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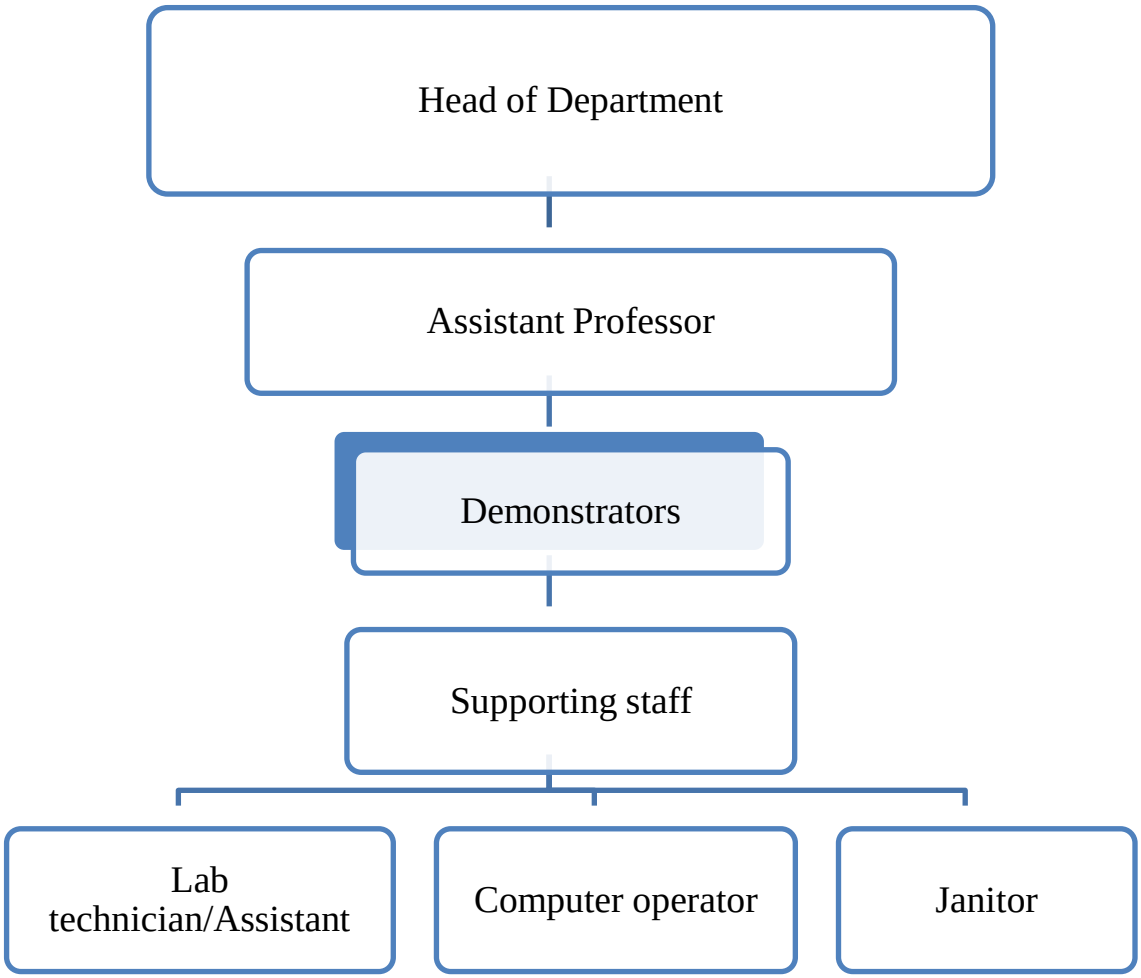
DEPARTMENTAL ORGANOGRAM



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COURSE INSTRUCTORS

Sr. No.	Name	Designation
1	Prof. Dr. Fahd Mehtab ud-din Dogar	Professor/ HOD
2		Assistant Professor
3		Demonstrator
4		Demonstrator

LIST OF PRACTICALS

Sr. No.	Topics
1.	Basics of ergonomics
2.	History taking
3.	Intraoral and extraoral examination
4.	Indices: DMFT
5.	Indices: CPITN
6.	Indices: Plaque index
7.	Indices: Dean's Fluorosis index
8.	Tooth discoloration
9.	Pit and fissure sealants
10.	Topical fluorides
11.	Plaque disclosing agents
12.	Tooth brushing techniques
13.	Flossing techniques
14.	Oral hygiene instructions
15.	Dental instruments and materials
16.	Atraumatic restorative treatment
17.	Hand washing and personal protective equipment
18.	Needlestick injury and immunization
19.	Disinfection and sterilization
20.	Waste disposal
21.	Disinfection of dental unit

COURSE LEARNING OBJECTIVES

Topic	Course Content	Learning Outcome At the end of each topic, student will be able to	MIT	Assessment Tool
Health and disease	-Changing concepts of health -Dimensions of health -Indicators of health -Theories of disease progression -Iceberg of disease -Disease control, elimination and eradication -Screening -Dynamics of disease transmission -Stages of an infectious disease	-Define and distinguish the concepts of health, quality of life, impairment, and activitylimitation and participation restriction. -Enumerate different dimensions of health. -Enlist different indicators of health. -Describe the underlying range of factors that determine people's health. -Describe the concepts of disease, illness, and ill health. -Discuss the concept of natural history of disease, eradication and elimination of disease. -Draw spectrum of health and disease.	LGIS SGD	SEQ/MCQ/VIVA
Practice of public health	-Changing concepts -Characteristics of public health methods and techniques -Comparison and contrast between personal versus community health care	-Define public health. -Describe the historical evolution of public health. -Identify the core functions and accomplishments of public health. -Spot the links between clinical practice and dental public health. -Outline the criteria used to determine if a condition is a public health problem.	LGIS	SEQ/MCQ/VIVA
Nutrition	-Role of nutrients in public health -Importance of balanced diet -Nutritional problems -Oral manifestations associated with malnutrition	-Classify carbohydrates, proteins, fats, and the role they play in the oral cavity. -Identify the function of vitamins, minerals, and antioxidants and symptoms of excesses ordeficits. -Recognize specific nutrient requirements during the human life cycle. -Recognize the relationship between nutritional deficiencies and oral disease.	LGIS/ CBL	SEQ/MCQ/VIVA

Environment and health	-Role of major factors like water, air and noise -Disposal of Solid Wastes -Occupational Hazards	-Explain the characteristics of pure and wholesome water. -Classify different types of pollution: water, air, and noise. -Discuss different waste disposal methods. -Classify occupational hazards. -Explain oral manifestations of occupational diseases.	SGD	MCQ/VIVA
Health education	-Objectives and principle of health education -Practice of health education -Planning a dental health education program	-Define health education. -Outline the key messages in oral health education. -Describe the steps involved in planning health education. -Summarize different methods and materials used in health education. -Outline the principles of health education. -Create oral health education material. -Plan, implement and evaluate dental health education session.	LGIS/SGD	SEQ/MCQ/VIVA
Health care delivery system	-Elements of primary health care -Principles of primary health care -Principles of oral health promotion	-Describe the principles of primary health care. -Enumerate the elements of primary health care mentioned in Alma Ata Declaration. -Provide a definition of oral health promotion. -Outline the key principles of oral health promotion. -Describe the five areas for action outlined in the Ottawa Charter and provide oral healthexamples of each. -Explain the concept of advocacy, mediation, enabling in relation to health promotion. -List potential partners and settings for oral health promotion. -Emphasize the importance of working in partnership with other agencies and organizationsto promote health.	SGD	SEQ/MCQ/VIVA
Dental auxiliaries	-Classification -Functions of different types of dental ancillaries	-Classify oral health personnel. -Describe the role and use of persons complementary to dentists in provision of dental care.	SGD	SEQ/VIVA

Epidemiological methods	-Measurements in epidemiology -Epidemiological methods; descriptive, analytical and experimental -Advantages of epidemiology -Common terminologies	-Describe the contribution of epidemiology to the scientific study of health and disease. -Describe case studies in the history of epidemiology including, for example, John Snow's research on cholera, Joseph Goldberger's work on pellagra, and the Framingham heart study. -Describe and compute measures that characterize population dynamics, including birth and mortality rates and dependency ratios. -Relate the epidemiologic concepts of exposure, risk factor, and determinant to causal concepts. -Define and estimate different measures of incidence, including risk (cumulative incidence) and incidence rate. -Define and estimate point prevalence and period prevalence. -Describe examples of person, place, and time variables and discuss the contribution of person/place/time studies in epidemiologic research. -Define and describe distinctions between broad types of experimental and quasi experimental studies such as randomized clinical trials and community trials. -Define and describe the purpose of randomization, placebos and blinding; distinguish cluster versus individual randomization. -Identify and characterize basic designs, including cohort and case-control studies, and randomized controlled trials. -Describe and contrast advantages and disadvantages of each study design. -Identify common sources of bias for each design.	LGIS/ SGD	SEQ/MCQ/VIVA
Dental finance	-Mechanism of payment for dental care	-Define and classify mechanism of payment for health care system. -Discuss the main types of economic analyses and its limitations.	SGD	VIVA

Planning, survey and evaluation	Highlight the safety protocols and ethical considerations associated with the use of dental amalgam	-Define planning and outline the basic steps in the planning cycle. -Describe the range of information needed in planning dental services for improving oralhealth. -Define survey. -Describe strengths and weaknesses of different types of surveys. -Discuss different types of evaluation of dental health program planning.	LGIS	SEQ/MCQ/VIVA
Indices	-Ideal requisites and purposes of an index -Classification of indices for oral diseases	-Define dental indices. -Classify different dental indices. -Explain indices for dental plaque, debris, calculus, bleeding gums, gingival inflammation, periodontal diseases and fluorosis. -Describe the value of the DMF index in measuring oral disease. -Use the DMF index to measure the prevalence of dental caries. -Identify the factors that may or may not affect the DMF scores in adults. **SKILL** -Calculate a DMFT, DMFS, dmft or dmfs index score from a patient tooth charting. -Assess pocket depth, bleeding gums and calculus deposits by using CPITN. Integrated with periodontology	LGIS/SGD	SEQ/MCQ/OSPE VIVA
School dental health	-Components of school dental health -Comprehensive dental care -Incremental dental care	-Define school dental health. -Explain components of school dental health. -Differentiate between comprehensive and incremental dental care.	LGIS	SEQ/VIVA
Prevention	-Levels of prevention -Preventive services	-Describe levels of prevention. -Explain differing strategy approaches in prevention. -Outline the stages necessary in planning any strategy. -Describe the rationale for choosing between approaches.	LGIS	SEQ/MCQ

Ethical issues	-Principles -Code of ethics -Legal vulnerability in dental practice -Introduction to forensic dentistry	-Identify fundamental ethical principles that guide the conduct of research involving humanparticipants and be aware of their historical roots. -Describe the basic principles of confidentiality, veracity, autonomy, beneficence, and non-maleficence. -Define informed consent and describe the elements that should be included in an informedconsent document or procedure.	LGIS	SEQ/MCQ
Primary preventive services	-Plaque control -Disclosing agents -Caries activity test -Pit and fissure sealants	-Review primary preventive services; plaque control, disclosing agents and caries activitytests. -Assess the preventive options for oral diseases. -Outline preventive and health promotion approach appropriate for prevention of oraldiseases. **SKILL** -Administer plaque disclosing agents. -Perform flossing. -Describe proper procedures for the use and handling of toothbrushes among patients.	LGIS/SGD PRACTICAL	SEQ/MCQ/OSPE VIVA
Atraumatic restorative treatment	-Principles -Advantages and disadvantages -Indications and contraindications -Technique	-Explain ART in detail. -Enlist principles for using hand instruments and GIC. -Enumerate indications and contraindications of ART. -Describe the armamentarium used. **SKILL** -Perform ART procedure. Integrated with science of dental materials and operative dentistry	LGIS/SGD PRACTICAL	SEQ/MCQ/OSPE-VIVA
Oral health care for special groups	-Oral manifestations -Oral injuries	-Define special groups. -Enlist oral manifestations associated in special needs groups. -Explain dental needs in special groups.	LGIS	SEQ/VIVA

Fluorides	-Mechanism of action of systemic fluorides -Classification of topical fluorides -Fluoride toxicity -Defluoridation **SKILL** -Application of topical fluorides Integrated with operative dentistry	-Describe how fluoride works in prevention of dental caries. -List and describe methods of fluoride delivery. -Cite the advantages and disadvantages of each mode of delivery. -Discuss pros and cons of fluorides in caries prevention. -Explain methods of defluoridation. -Describe toxicity of fluoride.	LGIS/SGD	SEQ/MCQ/OSPE VIVA
Sterilization and disinfection	-Factors that influence the development of infection -Factors that alter the normal defenses -Objectives of infection control -Process of sterilization -Barriers for patients and clinicians -Use of personal protective equipment	-Describe proper instrument sterilization techniques. -List heat sterilization methods–steam autoclave, dry heat (oven-type), dry heat (rapid heat transfer) and unsaturated chemical vapor–with the advantages and precautions of each method. -Decontaminate critical, semi-critical and noncritical items using salient sterilization methods. **SKILL** -Demonstrate method of disinfection.	LGIS/ PRACTICAL	SEQ//VIVA OSPE
Biostatistics	-Data and variables -Measures of central tendency and dispersion -Normal distribution curve -Tests of significance -Sampling techniques	-Describe and distinguish various types of data, including numerical and categorical. -Distinguish and use various kinds of tables and graphs to present data. -Describe data collection methods and instruments. -Explain the need for sampling and the advantages of various methods of sampling inepidemiologic studies. -Distinguish between probability and non-probability sampling. -Describe the most common methods of probability sampling used: simple random, stratified, systematic, and cluster sampling. -Describe methods of non-probability sampling used: convenience, purposive, snowball and quota sampling. -Define randomness and probability -Define variable and distinguish qualitative and quantitative variables.	LGIS/SGD	SEQ/MCQ/VIVA

		-Define the properties of the normal ("Gaussian") curve. -Describe the principles underlying the use of parametric and nonparametric tests, their advantages, andtheir disadvantages. -Calculate measures of central tendency and dispersion.		
Behavioral sciences	-Sociology -Social psychology and anthropology -Behavior modification/shaping	-Define and classify social sciences. -Explain the concept of sociology, social psychology, and social anthropology. -Outline behavior management strategies. -Explain different ingredients of behavior management. Integrated with behavioral sciences	LGIS	SEQ/MCQ
Epidemiology of oral diseases	Epidemiology of; -Dental caries -Oral cancer -Periodontal diseases -Malocclusion	Explain current concepts about etiology, natural history and epidemiology of oral diseasesand conditions having public health implications like dental caries, periodontal disease, malocclusion, tooth wear, and oral cancer. Integrated with pathology, periodontology, operative dentistry, orthodontics and OMFS.	LGIS/ SGD/ CBL	SEQ/MCQ/VIVA

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CONTRIBUTION IN INTEGRATED TEACHING

	1ST YEAR	2ND YEAR	3RD YEAR	4th YEAR	EXTRA COURSES
Subject		**Science of Dental Materials**		**Operative Dentistry**	
Topic		**ART**		**ART**	
SLOs		-Manipulation of GIC		-Formation of cavity	
Topic				**Dental caries**	
SLOs				-Classify dental caries -Management of dental caries	
Topic				**Fluorosis**	
SLOs				-Management of fluorosis	
Subject		**Pathology**		**OMFS**	
Topic		**Cancer**		**Oral Cancer**	
SLOs		-Difference between benign and malignant neoplasm		-Classify oral cancer -Surgical management of oral cancers	
Topic		**Sterilization**		**Sterilization**	
SLOs		-Non-resistant microbes		-Describe methods of sterilization and disinfection	
Subject			**Periodontology**		
Topic			**Periodontal diseases**		
SLOs			-Classification & management of periodontal lesions		
Topic			**CPITN**		
SLOs			-Method of performing CPITN		
Subject				**Orthodontics**	
Topic				**Malocclusion**	
SLOs				-Etiology of malocclusion -Angle's classification	

Subject		**Behavioral Sciences**			
Topic		**Behavioral management**			
SLOs		-Outline behavior management strategies. -Explain different ingredients of behavior management.			

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ASSESMENT

Exam Component	Marks
Formative Assessment MCQs SEQs **Total**	 20 30 **50**
Internal Assesment	**20**
Summative Assessment **Theory** **a. SEQs: 15 (**03 marks each) **b. MCQs. 45 (**01 mark each) **Total**	 45 45 **90**
Viva Voce **a. Internal Examiner:** 30 marks **b. External Examiner:** 30 marks **Total**	 30 30 **60**
OSPE **a. Observed Stations:** There are 2 observed stations; 06 marks each **b. Non-Observed Stations:** There are 6 non - observed stations; 03 marks each **Total**	 12 18 **30**

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LEARNING RESOURCES

- Heirmath SS. Textbook of Preventive and Community Dnetistry. 2nd Edition. Elsevier.
- Gluck G, Morganstein WM. Jong's Community Dental Health. 5th Edition. Mosby.
- Mir AM. A Synopsis of Epidemiology and Basic Statistics. 2nd Edition.
- Daly B, Watt R, Batchelor P, Treasure E. Essential Dental Public Health. Oxford University Press. Murray JJ. Prevention of Oral Disease. 3rd Edition. Oxford University Press.
- Pine C. Community Oral Health. 2nd Edition. Quintessence- London.
- Felton A, Chapman A, Felton S. Basic Guide for Oral Health Education and Promotion. 2nd Edition. Blackwell Munksgaard.

Practical Manual:

- Manual & logbook of Community and Preventive Dentistry.

RAHBAR COLLEGE
OF DENTISTRY

Department of Science of Dental Materials

Study Guide

2026

RCoD LAHORE

WELCOME NOTE

Welcome to Science of Dental Materials!

Dear Students,

Welcome to your second year in the Science of Dental Materials course. As the Head of this department, I am excited to guide you through this vital part of your dental education. This subject forms the foundation for understanding the materials you will work with throughout your career, from restorative materials to prosthetics and beyond.

In this course, we will explore the properties, applications, and limitations of various dental materials, equipping you with the knowledge to make informed decisions in clinical practice. You will learn to think critically about material selection, the impact of these materials on oral health, and the future of dental innovation.

Our goal is not just to teach you the theoretical aspects, but also to inspire you to apply this knowledge in practical settings. I encourage you to ask questions, engage in discussions, and challenge yourself to think beyond the textbook.

This guide will serve as a roadmap for the course, outlining key concepts, learning objectives, and resources. I hope it helps you stay organized and focused throughout the year.

Looking forward to a productive and insightful journey together!

Warm regards,

Dr. Omair Anjum
Head, Department of Science of Dental Materials

RATIONALE FOR THE COURSE

The subject of science of dental materials teaches the students to recognize the clinical, technical and scientific rationale for the use of dental biomaterials in clinical dental practice. The undergraduate curriculum introduces basics of materials science to students which enables them to study the physical and chemical properties of a wide range of dental biomaterials. The course aims to develop an understanding of how dental biomaterials behave in the clinical environment and which characteristics determine their selection for clinical application. The students will learn about the scientific and practical issues that need to be considered when evaluating these materials and to identify their characteristics that affect their biocompatibility and safety. The course involves hands-on experience of dental materials and their manipulation in the laboratory.

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DEPARTMENTAL DETAILS

Head of the department	Dr. Omair Anjum
Study guide developed by	Dr. Omair Anjum Dr. Muhammad Saad Ullah
Total Lectures	180
Tutorials	36
SGDs	18

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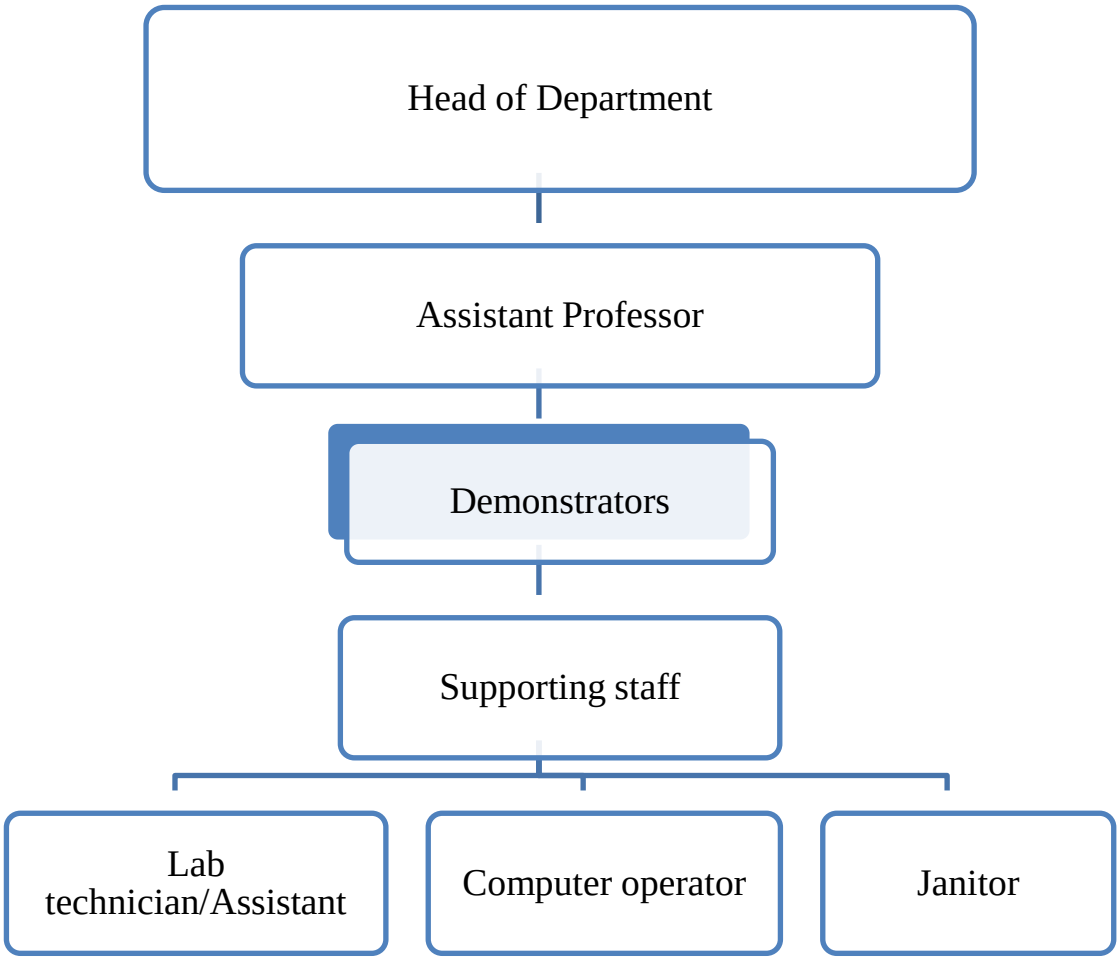
DEPARTMENTAL ORGANOGRAM



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COURSE INSTRUCTORS

Sr. No.	Name	Designation
1	Dr. Omair Anjum	Associate Professor
2	Dr. Muhammad Saad Ullah	Assistant Professor
3	Dr. Aaminah Imran	Demonstrator

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LIST OF PRACTICALS

Sr. No.	Topics
1.	Introduction to dental materials lab work
2.	Manipulation of soft and hard plasters demonstration
3.	Making plaster slab 4”x4”
4.	Wire bending exercises
5.	Wire exercises - Alphabets
6.	Manipulation of alginate
7.	Manipulation of impression compound
8.	Manipulation of zinc oxide eugenol impression paste on special tray
9.	Manipulation of rubber based Impression materials
10.	Demonstration and manipulation of different types of dental waxes
11.	Manipulation of Acrylic resins
12.	Manipulation of Dental Amalgam
13.	Mixing of Zinc Phosphate Cement
14.	Mixing of Glass Ionomer Cement
15.	Mixing of Calcium Hydroxide Cement
16.	Mixing of Zinc Oxide Eugenol Cement
17.	Clasp making Exercises
18.	Demonstration of steps of composite restoration / bonding on extracted molar
19.	Demonstration of steps in sandwich technique on extracted molar.
20.	Casting / PFM Lab Demonstration in Ceramic Lab

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COURSE LEARNING OBJECTIVES

Topic	Course Content	Learning Outcome At the end of each module, student will be able to	MIT	Assessment Tool
I. General classes and properties of dental materials	Provide background knowledge regarding structure of matter.	Describe the basic classification of dental materials Describe the structure of matter and principles of adhesion	LGIS	SEQ/MCQ/VIVA
	Provide a comprehensive account of relationship between general properties of dental materials and their clinical performance.	Describe knowledge of the fundamental biological, chemical and physical principles of material science	LGIS	SEQ/MCQ/VIVA
	Provide knowledge about clinical performance of biomaterials under biological limitations	Describe knowledge of the range of biological consideration regarding the selection and performance of dental materials	LGIS	SEQ/MCQ/VIVA
	Allow the students to develop a critical understanding of the factors that determine the safe and correct use of materials in dentistry.	Explain the knowledge of safety, biocompatibility and biomechanics as they relate to the correct clinical use of dental materials.	LGIS	SEQ/MCQ/VIVA
II. Direct restorative materials				
i. Dental Amalgam	Provide students with an understanding of its types and classification Provide students with a comprehensive understanding of its properties, clinical applications, and techniques. Educate students on the clinical uses and advantages of dental amalgam. Ensure students grasp the fundamental properties and composition of dental amalgam. Teach students the correct techniques for handling, mixing, and applying dental amalgam. Highlight the safety protocols and ethical considerations associated with the use of dental amalgam	**KNOWLEDGE**: Describe the history, composition and classification of dental amalgams. Explain the setting mechanism of different types of dental amalgams. Explain the properties of dental amalgams. Describe the issues related to amalgam hygiene in clinical practice. Explain the biocompatibility issues relating to dental amalgams. Describe recent advancements in dental amalgams. Integration with Operative Dentistry	LGIS /SGD	SEQ/MCQ/VIVA

		Describe clinical application, indications/contraindications and steps involved in preparing and mixing dental amalgam. Describe the techniques for placing and finishing amalgam restorations, including cavity preparation, amalgam condensation, and carving Describe and manage complications related to amalgam restorations.		
		SKILL: Demonstrate clinical manipulation and factors affecting the properties of dental amalgams. Demonstrate the correct dispensing, trituration and application of dental amalgam. Demonstrate hand mixing and mechanical mixing of dental amalgam	Practical	OSPE/VIVA
		ATTITUDE: Demonstrate learning attitude Demonstrate a commitment to using dental amalgam in ways that prioritize the patient's health and well-being. Demonstrate attitude regarding safety protocols, including the proper handling of mercury and other materials associated with dental amalgam.	Practical	OSPE/VIVA
ii. Dental Cements	Educate students on the types and classification of various dental cements. Ensure students comprehend the physical and chemical properties of various dental cements.	**KNOWLEDGE:** Describe the objectives and basic terminologies related to dental cements. Describe the general requirements, types and properties of different dental cements.	LGIS /SGD	SEQ/MCQ/VIVA

	Educate students on the appropriate clinical uses and indications for various dental cements. Facilitate understanding of how different dental cements compare to one another. Integrate the use of dental cements into comprehensive treatment plans. Teach students the correct techniques for mixing, handling, and applying dental cements. Highlight the safety protocols and precautions associated with the use of dental cements.	Explain the chemical composition, setting mechanism of different dental cements. Explain the properties, advantages and disadvantages of different dental cements. Describe the concept of bases and liners for different clinical applications. Describe luting agents, types and their properties Explain the use of temporary restorative materials, properties, their uses and manipulation Define Atraumatic Restorative Technique (ART) and its uses Integration with Operative Dentistry Describe the clinical applications of different dental cements. Describe specific clinical indications for each type of cement, including their use in permanent restorations, temporary restorations, liners, and bases. Demonstrate the proper techniques for mixing, handling, and applying each type of cement, including any special considerations for different clinical scenarios		
		SKILL: Identify different types of dental cements. Demonstrate the correct dispensing, mixing and application of: • Zinc phosphate cement • Zinc oxide eugenol cement • Glass ionomer cement	Practical	OSPE/VIVA

		Calcium hydroxide cement		
		ATTITUDE: Demonstrate learning attitude Demonstrate a commitment to using dental cements in ways that prioritize the patient's health and well-being. Demonstrate safety protocols in the handling and application of dental cements, including proper mixing and use of protective measures.		
iii. Restorative Resin Composite	Ensure students comprehend the types and physical and chemical properties of various dental composites. Educate students on the appropriate clinical uses and indications for dental composites Integrate the use of dental composites into comprehensive treatment plans. Emphasize safety protocols and precautions associated with the use of dental composites. Facilitate understanding of how dental composites compare to other restorative materials. Encourage students to stay updated with advancements and best practices in composite technology. Provide hands-on experience with dental composites to develop practical skills	**KNOWLEDGE:** Describe the history and classification of restorative composites. Describe the properties of different components of restorative composites. Explain different modifications in relation to restorative composites. Describe finishing and polishing procedures for restorative composites. Explain the biocompatibility issue related to restorative composites. Describe the recent advancements in restorative composites. Integration with Operative Dentistry Demonstrate clinical manipulation of restorative composites Describe indications to use dental composites for various restorations, such as in anterior and posterior teeth, and understanding the limitations.	LGIS/SGD	SEQ/MCQ/VIVA

	Teach students the correct techniques for mixing, handling, and applying dental composites	Describe the clinical applications for composite restorative materials.		
		SKILL: Identify and familiarize with the armamentarium used for composite restorations i.e. • Visible light cure unit • Acid etching gel • Bonding agent • Restorative composite Demonstration of different steps in composite restoration on extracted teeth. Demonstration of steps in sandwich technique on extracted teeth.	Practical	OSPE/VIVA
		ATTITUDE: Demonstrate a commitment to using dental composites in ways that prioritize the patient's health and well-being. Develop an attitude of adhering to safety protocols in the handling, mixing, and application of dental composites, including proper use of personal protective equipment (PPE) and following manufacturer instructions		OSPE/VIVA
iv. Denting Bonding Agents & Adhesive Dentistry	Highlight the importance of effective bonding and adhesion in the use of dental composites. Ensure students understand the fundamental principles of dentin bonding and the science behind it. Educate students on the appropriate clinical uses and indications for dentin bonding agents Guide students in selecting the appropriate bonding agents based on clinical needs and materials used.	**KNOWLEDGE:** Describe the concept of bonding and adhesion in dentistry. Define enamel and dentine bonding. Explain the significance and rationale behind enamel and dentine bonding. Describe various types and generations of bonding agents.	LGIS	SEQ/MCQ/VIVA

	Teach students the correct techniques for applying dentin bonding agents effectively. Emphasize the importance of safety and proper handling when working with dentin bonding agents.	Explain the significance of biodegradation of restorative resins. Explain recent advancements in dentin bonding agents. Integration with Operative Dentistry Describe clinical concepts of etching, dentin bonding and significance of hybrid layer		
		ATTITUDE: Demonstrate safety protocols in the handling and application of dental bonding, including proper handling and use of protective measures.	LGIS	SEQ/MCQ/VIVA/OSPE
III. Indirect restorative materials				
i. Denture base acrylic resins	Ensure students comprehend the physical and chemical properties of denture base acrylic resins. Educate students on the appropriate clinical uses and indications for denture base acrylic resins. Guide students through the processes involved in fabricating denture bases using acrylic resins. Teach students the correct techniques for handling, mixing, and processing denture base acrylic resins. Highlight the safety protocols and precautions associated with using denture base acrylic resins. Facilitate understanding of how denture base acrylic resins compare to other denture base materials.	**KNOWLEDGE:** Describe the definition of a denture base material, explain their different types used and ideal properties and types of denture base materials Explain the chemical composition and properties of denture base materials. Describe biocompatibility issues associated with denture base materials. Integration with Prosthodontics Describe various methods of polymerization of denture base materials. Describe the clinical application, manipulation, processing, and methods of attachment of metallic framework and teeth to denture bases.	LGIS	SEQ/MCQ/VIVA

		Describe the various procedures involved in the fabrication of denture base materials		
		SKILL: Demonstrate the correct dispensing, manipulation and application of self-cure and heat-cure dental acrylic resin	Practical	SEQ/MCQ/VIVA/OSPE
		ATTITUDE: Demonstrate a commitment to using dental acrylics in ways that prioritize the patient's health and well-being. Demonstrate safety protocols in the handling and application of dental acrylics	Practical	SEQ/MCQ/VIVA/OSPE
ii. Denture relining & rebasing materials	Ensure students understand the physical and chemical properties of relining and rebasing materials. Educate students on the appropriate clinical uses and indications for relining and rebasing materials. Teach students the correct techniques for handling, applying, and processing relining and rebasing materials.	**KNOWLEDGE:** Explain relining and rebasing procedures for dentures. Describe various types of relining and rebasing dental materials, their properties and composition Explain biocompatibility issues associated with relining and rebasing materials in dentistry. Integration with Prosthodontics Describe the criteria for case selection for relining and rebasing procedures, their clinical application and appropriate selection of materials	LGSI/SGD	SEQ/MCQ/VIVA/OSPE
		SKILL: Describe manipulation and properties of relining and rebasing materials.	Practical	
iii. Tissue Conditioners	Ensure students comprehend the physical and chemical properties of tissue conditioners.	**KNOWLEDGE:** Describe the properties, composition and role of tissue conditioners	LGIS /Practical	SEQ/MCQ/OSPE/VIVA

	Educate students on the appropriate clinical uses and indications for tissue conditioners. Teach students the correct techniques for handling, mixing, and applying tissue conditioners. Guide students through the procedures involved in using tissue conditioners	Understand various types of tissue conditioners used in dentistry. Understand and discuss the properties of various tissue conditioners used in dentistry. **Integration with Prosthodontics** Describe the steps of clinical manipulation of tissue conditioners. Describe the criteria for case selection for tissue conditioners, their clinical indication and contraindication.		
iv. Dental Ceramics	Ensure students comprehend the types, physical, chemical, and mechanical properties of dental ceramics. Educate students on the appropriate clinical uses and indications for different types of dental ceramics. Highlight the importance of bonding and cementation in the successful use of dental ceramics. Teach students the correct techniques for handling, shaping, and processing dental ceramics. Emphasize safety protocols and precautions associated with using dental ceramics Facilitate understanding of how different dental ceramics compare to other restorative materials. Provide hands-on experience with dental ceramics to develop practical skills	**KNOWLEDGE:** Describe the basic chemistry and composition of ceramics. Explain the composition, properties and classification of different dental ceramics systems. Describe general procedures involved in fabrication of dental ceramics. Describe the concept of metal ceramic bonding. Describe metal ceramic restorations, their uses and properties. Describe all ceramic restoration materials, their uses and properties. Describe methods of strengthening ceramics. Integration with Prosthodontics Describe the clinical application and indications for metal ceramic and all ceramic restorations Demonstrate appropriate selection of ceramics	LGIS/SGD	SEQ/MCQ/VIVA

		based on factors like esthetics, strength requirements, and patient-specific considerations. Explain the steps involved in the fabrication of ceramic and metal ceramic restorations		
		SKILL: Identification of different ceramic restorations and their processing	Practical	OSPE/VIVA
		ATTITUDE: Demonstrate learning attitude Demonstrate a commitment to using dental ceramics in ways that prioritize the patient's health and well-being.	Practical	
v. Metals used in dentistry	Ensure students comprehend the types, physical, chemical, and mechanical properties of metals used in dentistry. Educate students on the appropriate clinical uses and indications for different types of metals in dentistry. Teach students about different types of metal alloys and their compositions Guide students through the fabrication techniques for metal-based dental restorations. Emphasize safety protocols and precautions associated with metals in dentistry Facilitate understanding of how different metals compare to other restorative materials. Encourage students to stay informed about advancements and best practices in dental metal technology.	**KNOWLEDGE:** Describe the basic concepts related to processing and solidification of dental alloys. Explain different types of metals and alloys used in fabrication of dental prosthesis. Explain the alloy phase diagrams. Explain the types, composition, properties and clinical applications of high noble and noble metal alloys. Explain the types, properties, composition and clinical applications of base metal alloys. Explain the casting procedures for metal alloys. Explain the types, processing, composition and clinical applications of wrought metal alloys.	LGIS/SGD	SEQ/MCQ/VIVA

	Provide hands-on experience with metals to develop practical skills.	Explain the types, composition and properties of stainless steel in dentistry. Describe the significance, composition, properties and clinical applications for titanium and its alloys in dentistry. Describe the properties and composition of various orthodontic wires. Integration with Prosthodontics Describe clinical applications for different metal alloys, such as in crowns, bridges, dentures, and other restorations. Explain the laboratory steps involved in the processing of dental alloys (Ni-Cr, Co-Cr) Explain the selection of material for soldering and welding and their laboratory procedures. Integration with Orthodontics Describe clinical application of various orthodontic wires and rational of wire selection		
		SKILL: Identification of different indirect metallic restorations Identification of different orthodontic wire used in dentistry	Practical	OSPE/VIVA
		ATTITUDE: Demonstrate a commitment to using dental alloys in ways that prioritize the patient's health and well-being.	Practical	
vi. Soldering and Welding	Teach the properties of materials used in dental soldering and welding, such as alloys and their melting points.	**KNOWLEDGE:** Describe the objectives and uses of soldering and welding in dentistry.	LGIS	SEQ/MCQ/VIVA

	Show how soldering and welding fit into the broader context of dental procedures and how they complement other skills in restorative and orthodontic dentistry. Teach the components of materials used in dental soldering and welding Show how soldering and welding techniques are used to fabricate and repair dental prosthetics like crowns, bridges, and orthodontic appliances.	Describe the differences between soldering, brazing and welding. Describe the components of dental solders and welding. Explain different heat sources for soldering and welding. Describe welding and it's types. Integration with Prosthodontics Demonstrate appropriate selection of material for soldering and welding and their laboratory procedures.		
vi. Dental Implants		**KNOWLEDGE:** Describe the history of implants in dentistry. Define osseointegration and its factors affecting it. Explain different types of implants used in dentistry. Describe materials used for dental implants.	LGIS/SGD	SEQ/MCQ/VIVA
IV. Auxiliary Dental Materials				
i. Gypsum Products	Explain the chemical composition and setting reactions of gypsum products (such as plaster, stone, and high-strength stone) Explain the manufacturing techniques of gypsum products (such as plaster, stone, and high-strength stone) Explain the use of gypsum products in creating accurate dental models and dies for various restorative procedures. Teach the correct mixing ratios and techniques for preparing gypsum products to	**KNOWLEDGE:** Describe the properties, types, uses, and manipulation of gypsum products. Explain the method of manufacturing and properties of gypsum products used in dentistry. Describe the setting reactions of different types of dental gypsum products. Describe the manipulation factors that affect the setting time and physical and mechanical properties of gypsum products.	LGIS/ Practical	SEQ/MCQ/VIVA

	ensure optimal consistency and strength. Teach techniques for trimming, finishing, and polishing gypsum models to achieve the desired accuracy and surface quality.	Explain and demonstrate the methods used for the disinfection of dental gypsum models and study casts.		
		SKILL: Demonstrate the proper mixing technique of dental gypsum used for preparing study models and casts. Identify different types of gypsum products. Demonstrate the correct dispensing ratio of different gypsum products. Demonstrate the correct mixing technique for gypsum products. Integration with Prosthodontics Demonstrate pouring of accurate and detailed models or casts from dental impressions, including techniques for trimming and finishing	Practical	OSPE/VIVA
		ATTITUDE: Demonstrate safety protocols in the handling and application of gypsum products	Practical	OSPE/VIVA
ii. Impression Materials	Educate on the different types of impression materials (e.g., alginate, polyvinyl siloxane (PVS), polyether) and their physical and chemical properties. Teach how to select appropriate impression materials based on the specific clinical situation, such as type of impression needed (e.g., preliminary, final) and patient requirements. Emphasize the importance of achieving accurate impressions to ensure the fit and	**KNOWLEDGE:** Describe the significance of impression and impression materials in dentistry. Explain the general requirements for an ideal impression material Describe the classification, characteristics and properties of elastic and non-elastic impression materials.	LGIS/SGD	SEQ/MCQ/VIVA

	functionality of restorations and prosthetics.	Describe the properties and clinical application of different types of impression materials.		
	Instruct on the proper mixing techniques, including the correct ratios of base and catalyst (if applicable), to achieve optimal consistency and accuracy.			
	Discuss proper handling and storage of impression materials to prevent premature setting or contamination.	**SKILL:** Demonstrate proper technique for mixing, handling and manipulation of the elastic and non-elastic impression materials. Demonstrate the correct dispensing, manipulation and application of: • Alginate • ZnO-eugenol paste • Impression compound • Elastomeric impression materials **Integration with Prosthodontics** Demonstrate selection of appropriate impression material for various clinical situations, such as single-tooth restorations, full arch impressions. Demonstrate correct proportioning and mixing of impression materials to achieve the desired consistency and avoid issues like air bubbles or improper setting Demonstrate accurate handling and pouring of impressions	Practical	OSPE/VIVA
	Teach protocols for disinfecting and cleaning impression materials to ensure patient safety and prevent cross-contamination.			
		ATTITUDE: Demonstrate safety protocols in the handling and application of impression materials, including proper mixing and use of protective measures for infection control.	Practical	

iii. Dental Waxes	Educate on the different types of dental waxes (e.g., pattern wax, bite registration wax, impression wax, casting wax) and their specific uses in dental procedures. Instruct on techniques for manipulating and shaping wax, including carving, molding, and adding or removing wax	**KNOWLEDGE** Describe the classification and types of waxes used in dentistry. Explain the composition, properties and application of different types of dental waxes. **Integrated with Prosthodontics** Demonstrate appropriate selection and use the appropriate type of dental wax for various clinical situations Demonstrate appropriate manipulation of dental waxes, including carving, shaping and create accurate wax patterns	Lecture	SEQ/MCQ/VIVA
	Discuss safety measures for handling dental waxes, including proper ventilation and the use of protective equipment. Offer practical sessions where students can work with different types of waxes to gain hands-on experience in manipulating and applying them.	**SKILL**: Describe different types of dental waxes. Demonstrate the manipulation and application of different: • Pattern waxes • Processing waxes Impression waxes	Practical	OSPE/VIVA
		ATTITUDE: Demonstrate safety protocols in the handling and application of waxes	Practical	

iv. Casting investments & casting procedures	Educate on different types of casting investments (e.g., gypsum-bonded, phosphate-bonded, and silica-based) and their specific applications and properties.	**KNOWLEDGE:** Define and explain investment materials used in dentistry. Describe different types of investment materials used in dentistry.	LGIS/SGD	SEQ/MCQ/VIVA

	Teach the proper techniques for mixing investment materials, including the correct ratios and methods to ensure proper consistency and setting.	Explain the composition, setting reaction and properties of gypsum bonded investment. Explain the composition, setting reaction and properties of phosphate bonded investment. Explain the composition, setting reaction and properties of silica bonded investment. Explain and compare properties and clinical applications of different types of investments. **Integrated with Prosthodontics** Describe the steps and methods involved in casting procedures. Demonstrate appropriate selection of investment materials for different dental applications, such as casting for crowns, bridges, and partial dentures.		SEQ/MCQ/VIVA
	Explain the burnout process, including the steps for heating the investment to remove the wax pattern and prepare the mold for casting.			SEQ/MCQ/VIVA
	Educate on selecting appropriate casting alloys and metals based on the type of restoration and desired properties.			SEQ/MCQ/VIVA
	Instruct on methods for inspecting castings for defects such as voids, misfits, or incomplete filling, and how to evaluate their accuracy and precision.			SEQ/MCQ/VIVA
	Discuss safety protocols related to handling casting materials, including protective equipment, ventilation, and safe use of high-temperature equipment.			SEQ/MCQ/VIVA
	Discuss recent advancements in casting investments and techniques, including new materials, technologies, and methodologies			SEQ/MCQ/VIVA

		SKILL: Identification of different types of investment materials	Practical	OSPE/VIVA
		ATTITUDE: Demonstrate safety protocols in the handling and application of investment materials	Practical	
v. Finishing and polishing materials	Educate on the various types of finishing and polishing materials used in dentistry, such as abrasive discs, strips, pastes, and rubber wheels.	**KNOWLEDGE:** Describe the objectives for finishing and polishing dental restorations and prosthesis. Describe the classification, composition, properties of abrasives and clinical applications for finishing and polishing materials. Explain the principles of finishing and polishing dental materials. Describe biological hazards associated with dental abrasive and polishing materials.	LGIS/Practical	SEQ/MCQ/VIVA/ OSPE
	Teach the purpose of finishing and polishing, including the improvement of restoration aesthetics, function, and longevity.			
	Demonstrate techniques for finishing restorations, such as removing excess material, smoothing rough surfaces, and refining contours.			
	Teach how to select and match finishing and polishing materials to the type of restoration and the specific material being worked on (e.g., composites, ceramics, metals).			

	Discuss safety protocols for using finishing and polishing materials, including proper ventilation, protective gear, and safe use of equipment	**SKILL:** Identify different types of cutting and abrasive instruments.	Practical	SEQ/MCQ/VIVA
		ATTITUDE: Demonstrate safety protocols in the handling and use of finishing and polishing materials	Practical	VIVA/OSPE
vi. Separating Media	Educate on various types of separating media used in dentistry	**KNOWLEDGE:** Describe the rationale behind the use of separating media in dentistry Describe and identify various types of separating media used in dentistry, including their composition, mechanism of action and properties. Explain the steps involved in manipulation of separating media.	LGIS /Practical	SEQ/MCQ/VIVA
	Discuss the properties of different separating media, including their chemical composition, viscosity, and compatibility with various dental materials.			
	Instruct on the correct application techniques for separating media to ensure effective separation without leaving residue or affecting the quality of the final product.			

	Discuss safety protocols related to the handling and use of separating media, including proper ventilation, protective equipment, and safe handling practices.	**SKILL:** Demonstrate the techniques for application of a separating media. **Integrated with Prosthodontics** Demonstrate correct application of separating media to ensure effective separation, including techniques for even application. Demonstrate appropriate selection of separating media for various clinical situations, such as separating wax patterns from investment materials or separating acrylic resin from casts	LGIS/Practical	SEQ/MCQ/VIVA/ OSPE
V. Preventive Dental Materials				
i. Dentifrices	Ensure that students understand the composition, types, use, and impact of these products on oral health	**KNOWLEDGE:** Describe the types, composition and purpose of dentifrices and mouthwashes. Integrated with Community Dentistry Demonstrate brushing methods Describe appropriate quantity of denitrifies for brushing	LGIS	MCQ/VIVA
ii. Fluoride agents	Discuss the composition, types, use, and benefits of fluoride agents on oral health	**KNOWLEDGE:** Describe different types of fluoride agents, their mode of action and application. Integrated with Community Dentistry Describe the role of Fluoride in prevention of caries Describe the recommended ages of fluoride application	LGIS	MCQ/VIVA

ii. Pit and fissure sealants	Discuss the composition, types, use, and clinical application of pit and fissure sealants on oral health	**KNOWLEDGE:** Explain the composition, properties, manipulation and clinical application of pit and fissure sealants. Integration with Community Dentistry **SKILL:** Demonstrate application of pit and fissure sealants on models	LGIS/Practical	MCQ/VIVA/ OSPE
VI. Endodontic materials	Discuss the composition, types, use, and clinical application of different materials used in endodontics	**KNOWLEDGE:** Describe and classify different endodontic materials used. Describe the composition and use of different irrigants, lubricants, medicaments used in endodontics. Describe the composition and properties of different obturating materials. **Integrated with Operative Dentistry** Describe steps involved in performing endodontic procedures. Describe how to prepare and apply endodontic materials, including techniques for using guttapercha, sealers, medicaments and irrigants effectively Describe the role of mineral trioxide aggregate (MTA) and other retrograde filling materials. **SKILL:** Identification of different endodontic materials used in dentistry	LGIS Practical	MCQ/VIVA OSPE/VIVA

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CONTRIBUTION IN INTEGRATED TEACHING

	1ST YEAR	2ND YEAR	3RD YEAR	4th YEAR	EXTRA COURSES
Subject				**Operative Dentistry**	
Topic				**Dental Amalgam**	
SLOs				Classify Dental Amalgam Explain properties of Dental Amalgam Describe the composition of dental amalgam	
Topic				**Dental Composite**	
SLOs				Classify Dental Composite Explain properties of Dental Composite Describe the composition of Dental Composite	
Topic				**Impression Materials**	
SLOs				Classify different Impression materials Explain properties of different Impression materials used for FPD	
Topic				**Dental Cements**	
SLOs				Describe different materials used for cementation of Crowns, veneers and FPD	
Subject				**Prosthodontics**	
Topic				**Impression Materials**	
SLOs				Describe elastic and non-elastic impression materials Describe disinfection protocols for various impression materials	
Topic				**Denture Base Materials**	
SLOs				Describe polymeric denture base materials Describe cast metal alloys used as denture base materials Compare the properties of porcelain and resin teeth	
Subject				**Orthodontics**	
Topic				**Orthodontic wires**	
SLOs				Classify Orthodontic wires Describe the composition and properties of Orthodontic wires	

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ASSESMENT

Exam Component	Marks
1. Internal Assesment	20
2. Theory **a. SEQs: 15** (03 marks each) **b. MCQs. 45** (01 mark each)	90
3. Viva Voce **a. Internal Examiner :** 25 marks **b. External Examiner :** 25 marks	50
3. OSPE **a. Observed Station:** There are 5 observed stations;, 5 marks each - Manipulation and mixing of material will be observed **b. Non-Observed Station:** There are 5 non - observed stations; 03 marks each	40

LEARNING RESOURCES

- **Phillips' Science of Dental Materials (12th Edition)** by Kenneth J. Anusavice, H. Ralph Rawls, and Chiayi Shen •

- **Craig's Restorative Dental Materials (14th Edition)** by Ronald L. Sakaguchi and John M. Powers

- **Introduction to Dental Materials (5th Edition)** by Richard Van Noort

- **Applied Dental Materials (9th Edition)** by John F. McCabe and Angus W.G. Walls

RAHBAR COLLEGE
OF DENTISTRY

Department of General Pathology and Microbiology

Study Guide

2026

WELCOME NOTE

Department of Pathology and the faculty are consistently endeavoring to achieve scholastic eminence and improvement in human health. The department of pathology is engaged in teaching of undergraduate students of BDS programs.

Pathology is a domain that furnishes diagnostic information to the clinicians. It influences all factors of patient care extending from diagnosing and taking care of cancer to the chronic diseases. Pathology constitutes of microbiology, General and Special Pathology. The goal is to spawn clinicians and surgeons with better grasp of the disease process so that they sensibly use diagnostic tools fashioned to aid them to arrive at a definitive diagnosis in the shortest possible time. The curriculum thus envelopes every known feature of contemporary investigations being undertaken across the globe.

The academic session incorporates the interactive lectures by skilled senior faculty members. Bench work incudes diverse staining and serological techniques. Small interactive group conferences are held among students & teachers. Intricate topics are discussed in addition to the lectures.

As its name signifies it is an area dedicated to the study of the cause, the pathogenesis, the morphological changes and functional disarray in cells, tissues and organs that trigger diseases. With the emergence of new technologies, pathologists are equipped to make diagnoses by inspecting a whole organ, a fraction of tissue, or even a few cells. All this is part of our curriculums. We have gone to extra lengths to make sure that our curriculum includes all the current developments in our field.

Pathology is a conjugative discipline embracing multilateral areas such as molecular, genetic, and sub-cellular levels, and therefor may entail obtaining body tissues, body fluid, and/or blood samples for analysis. Pathological studies aspire to understand how and why diseases advance, their signs and symptoms, and the complications of specific diseases. Needless to emphasize that all these aspects are integral part of our curriculum.

Our ultimate objective is to enhance the health care education connected to management of these diseases in clinical environment and to guide treating physicians and surgeons to deliver the finest possible healthcare to patients.

Dr. Sadaf Munir

Head, Department of General Pathology and Microbiology

RATIONALE FOR THE COURSE

People in Pakistan face numerous dental issues. The most prevalent being dental cavities, periodontal disorders and oral malignancies. The incidence of dental caries, gum diseases and oral infections is amongst the highest in the country. The problem is further compounded by difficult accessibility to dental healthcare in underprivileged and rural areas. This problem has exacerbated due to high sugar intake, poor dental care habits and ignorance in the populous. The course of General Pathology is seminal to gross efforts to fill these gaps in dental healthcare through our BDS Programme.

The Foundation module provides integration of core concepts of basic sciences and their use in clinical medicine. This will eventually lead to develop critical thinking for integration and application of basic knowledge for clinical application.

General Pathology fixates on the four aspects of a disease process i.e. the cause of disease (etiology), the mechanisms of disease development (pathogenesis), the structural alterations induced in the cells that effect organs of the body (morphologic changes), and the functional consequences of these changes (clinical significance).

General pathology provides a crucial understanding of disease mechanisms, which is essential for dentists to diagnose oral disease accurately. Many oral health issues are linked to systemic diseases (e.g., diabetes, cardiovascular disease). General pathology equips dentists with knowledge to recognize these connections. Also understanding pathology processes helps dentists develop comprehensive treatment plans.

The course has been designed to achieve the following:

Students must understand how diseases like diabetes, anemia and immune disorders manifest in the mouth.

- Focusing on inflammation, wound healing, and tissue repair, which are critical processes in the oral cavity for both disease and recovery from dental procedures.
- Understanding benign and malignant growths.
- Help students understand viral, bacterial, and fungal infections that affect oral tissues. Make students aware of immunological reactions in the oral cavity, including autoimmune diseases.
- Make students to cover congenital and development disorders affecting the teeth, gums and oral structures.

The course is disseminated through modern teaching methods i.e. use of real-life cases, hypothetical scenarios, encouragement of critical thinking and senior student mentorship. All this is complimented by a faculty of international repute. A lab setup exists which is routinely maintained and calibrated. Safety and security i.e. also ensured in these facilities.

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DEPARTMENTAL DETAILS

Head of department	Dr. Sadaf Munir
Study Guide developed by	Dr. Sadaf Munir
Total Lectures	180
Practical	34
SGDs / Tutorials	34

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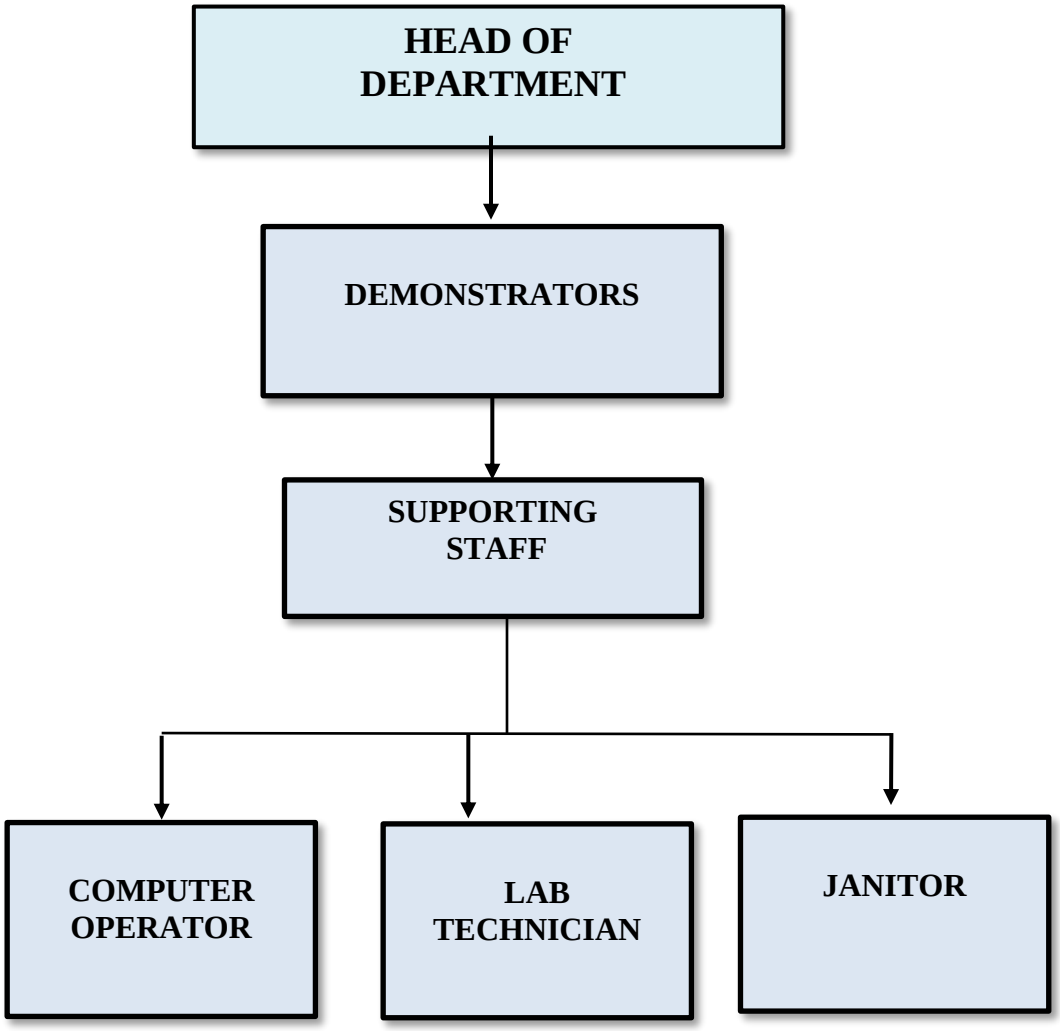
DEPARTMENTAL ORGANOGRAM



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COURSE INSTRUCTORS

Sr no.	Name	Designation
1	Dr. Sadaf Munir	Assistant Professor/ HOD
2		Demonstrator 1
3		Demonstrator 2

LIST OF PRACTICALS & TUTORIALS (SGDs)

Cell Injury

Sr. No.	Topic
	Practicals
1	Cellular adaptations
2	Caseous, liquefactive gangrenous necrosis
3	Caseous, fat & fibrinoid necrosis
4	Calcification & pigmentation
	Tutorials (SGDs)
5	Mechanisms of cell injury & reversible & irreversible injury
6	Cellular adaptation
7	Necrosis & apoptosis
8	Calcification and pigmentation

Inflammation and Mediators of Inflammation

Sr. No.	Topic
	Practicals
1	Acute Inflammation
2	Chronic Inflammation
3	Granulomatous Inflammation
	Tutorials (SGDs)
4	Vascular & Cellular events of acute inflammation
5	Morphological patterns of acute inflammation
6	Chronic & Granulomatous Inflammation

Healing & Repair

Sr. No.	Topic
	Tutorial (SGDs)
1	Wound healing by primary and secondary intention & complications of wound healing

Disorders of Circulation

Sr. No.	Topic
	Practicals
1	Hyperemia & congestion
2	Thrombosis
3	Infarction
	Tutorials (SGDs)
4	Edema, hyperemia & congestion
5	Thrombosis, embolism
6	Infarction & shock

Immunology

Sr. No.	Topic
	Practicals
1	Lab Diagnosis
2	Lab Diagnosis
	Tutorials (SGDs)
3	Cell of immune System, MHC, cellular & Humoral Immunity
4	Hypersensitivity Reactions

Neoplasia

Sr. No.	Topic
	Practicals
1	**Benign epithelial tumours**: Fibroadenoma breast Thyroid adenoma Papilloma Cyst adenomas
2	**Benign mesenchymal tumors** Leiomyoma Lipoma Teratoma/dermoid cyst Haemangioma
	Tutorials (SGDs)
3	**Malignant tumours**: Squamous cell carcinoma Basal cell carcinoma
4	**Malignant tumours**: Carcinoma breast Papillary carcinoma thyroid

Parasitology

Sr. No.	Topic
	Practical
1	Lab diagnosis of viral diseases
	Tutorials (SGDs)
1	Protozoa
2	Cestodes
3	Trematodes
4	Nematodes

Virology

Sr. No.	Topic
	Practical
1	Lab diagnosis of parasitic infestation
	Tutorials (SGDs)
1	DNA enveloped
2	DNA non-enveloped
3	RNA enveloped
4	RNA non-enveloped
5	Hepatitis

Microbiology

Sr. No.	Topic
	Practicals
1	Study of microscope
2	Gram staining
3	Culture media
4	Sterilization, disinfection & aseptic techniques
5	ZN staining and safe processing of sputum sample
6	Catalase test, coagulase test
7	DNAse test, oxidase test
8	Biochemical tests-1: TSI, citrate, utilization test
9	Biochemical tests-2: Motility, indole, urease test
10	Hospital infection prevention & control: Spill management, hand hygiene, prevention of needle stick injury
11	Stool examination
12	Urine examination
	Bacteriology - Tutorials (SGDs)
1	Bacterial morphology and structure
2	Bacterial classification and growth curue
3	Normal flora & pathogenesis
4	Bacterial genetics
5	Sterilization & disinfection
6	Antimicrobials and resistance to antimicrobials
7	Gram positive cocci: Staphylococci
8	Gram positive cocci: Streptococci
9	Gram negative cocci: Neisseria, moranella
10	Mycobacteria
11	Gram positive rods-1
12	Gram positive rods-2
13	Gram negative rods: Enterobacteriaceae-1
14	Gram negative rods: Enterobacteriaceae-2
15	Gram negative rods: Non-fermanters
16	Respiratory tract & actinomycetes
17	Spirochetes and zoonosis

COURSE LEARNING OBJECTIVES

Topic	Content	Learning Objectives	MIT	Assessment Tool
INTRODUCTORY LECTURE	Introduction to General pathology and Microbiology	• Introduction to faculty members & the subject • Academic calendar, teaching methodologies & assessment plan • Learning resources		
CELL INJURY	Causes of cell injury, reversible & irreversible injury Mechanisms of cell injury Cellular adaptations Necrosis & its types Apoptosis Intracellular accumulations	**Knowledge:** • Describe the sequence of ultra structural and biochemical changes which occur in the cell in response to ischemia, immunological injury, anaphylactic reaction, physical agents, genetic defects, nutritional deficiency and infectious agents / organisms. • Explain the reversible & irreversible cell injury. • Describe free radical and chemical injury. • Describe necrosis, list of its types with examples. • Describe apoptosis & its significance, and explain mechanism of apoptosis. • Enlist intracellular & extracellular accumulations. • Enlist exogenous & endogenous pigments. • Explain pathological calcification with its types and examples.	LGIS Small Group Discussion/ Problem-Based Learning	MCQs/ SEQs /OSPE
		Skill: Identify gross and microscopic pictures of: • Cellular adaptations • Caseous, liquefactive gangrenous necrosis • Caseous, fat & fibrinoid necrosis • Calcification & pigmentation **Attitude:**	Practical	OSPE

		• **Appreciate** the complexity and delicacy of cellular processes. • **Show respect** for the importance of early intervention, diagnostic accuracy, and understanding pathophysiology. • **Exhibit awareness** of the need for preventive measures, therapeutic targets, and ongoing research. • **Show interest** in how these concepts impact clinical practice, research, and disease management		VIVA
INFLAMMATION & MEDIATORS OF INFLAMMATION	Role of inflammation, acute inflammation Vascular changes of acute inflammation Cellular events of acute inflammation Chemical mediators of inflammation & arachidonic acid metabolism in inflammation Exogenous and endogenous pyrogens & morphological patterns of acute inflammation Chronic inflammation Systemic effects of acute and chronic inflammation	**Knowledge:** Describe the role of inflammation in the defense mechanisms of the body. • Describe the vascular changes of acute inflammation and relate these to the morphological and tissue effects. • Describe the process of chemotaxis, opsonization and phagocytosis. • Describe the role of cellular components in inflammatory exudates. • Differentiate between exudates and transudate. • Enlist the important chemical mediators of inflammation. • Describe the pathway of arachidonic acid metabolism. • Discuss the role of products of arachidonic acid metabolism in inflammation. • Describe the mechanism for development of fever, with reference to exogenous and endogenous pyrogens. • Describe chronic inflammation.	LGIS Small Group Discussion/ Problem-Based Learning	MCQs/ SEQs/ OSPE

		• Describe granuloma and list its type along with causes. • Describe the systemic effects of acute and chronic inflammation and their possible outcomes. • Describe the significance of CBC and ESR. **Skill:** Identify the following on microscopic and gross examination: ○ Acute appendicitis ○ Chronic cholecystitis ○ Chronic granulomatous inflammation ○ Morphological patterns of inflammation Draw labeled diagrams of all the inflammatory cells **Attitude:** • Show greater interest and curiosity in the topic. • Exhibit improved grasp of inflammation mechanisms and impacts. • Show recognition of real-world relevance in health and disease. • Exhibit better analytical skills and application of knowledge.	Practical	OSPE / VIVA OSPE / VIVA
HEALING & REPAIR	Repair and regeneration Wound healing by first and second intention Complications of wound healing	**Knowledge:** • Describe healing in specialized tissue. **Integration with OMFS** • Describe the differences between repair and regeneration. • Describe wound healing by first and second intention. • Discuss the factors that influence the inflammatory reparative response. • Describe the formation of granulation tissue, and scar	LGIS Small Group Discussion/ Problem-Based Learning	MCQs/ SEQs/ VIVA

		• Describe the complications of wound healing. Compare wound contraction with cicatrization. **Skills Outcome:** • Comprehend the process repair vs. regeneration and the phases of wound healing. • Handle wounds healing by first and second intention. • Identify and manage issues like infection and scarring. • Evaluate wound status and progress. **Attitude Outcome:** • Recognize the complexity of wound healing. • Develop a patient-centered approach to care. • Focus on preventing complications and effective management. • Stay updated on advancements in wound care.	Practical	OSPE/ VIVA OSPE / VIVA
DISORDERS OF CIRCULATION	Thrombosis & embolism Edema Hyperemia, congestion & role of endothelium Hemostasis and coagulation Infarction Shock	**Knowledge:** **Integration with Physiology:** • Explain the pathogenesis of thrombosis. • Describe the possible consequences of thrombosis. • Define and classify emboli according to their composition. • Describe the difference between arterial and venous emboli. • Define edema, ascites, hydrothorax and anasarca. • Describe the pathophysiology of edema with special emphasis on chronic heart failure. • Describe the pathogenesis of four major types of shock (hypovolemic, cardiogenic, vasovagal & septic) and list their causes.	LGIS Small Group Discussion/ Problem-Based Learning	MCQs/ SEQs/ OSPE

		• Describe the compensatory mechanisms involved in shock **Skill:** • Identify the following on microscopic and gross examination: ✓ Hyperemia & congestion ✓ Thrombosis ✓ Infarction **Attitude:** • Show greater understanding of complex conditions like thrombosis, embolism, and shock. • Display increased focus on early detection and effective management of circulatory disorders. • Exhibit better appreciation for the patient impact of conditions such as edema and infarction. • Show motivation to stay updated on advancements in treatment and management. • Show improved ability to analyze and address symptoms and causes of circulatory issues.	Practical	OSPE / VIVA VIVA
GENETICS	Introduction Common sex linked, autosomal recessive and autosomal dominant disorders Common genetic mutations Diseases associated with consanguineous marriages Molecular biology techniques	**Knowledge:** • Enlist the common sex linked, autosomal recessive and autosomal dominant disorders. • Describe and give examples of common genetic mutations. • Describe diseases associated with consanguineous marriages. • Describe molecular biology techniques. **Skills Outcome:**	LGIS Small Group Discussion/ Problem-Based Learning Practical	MCQs / SEQs OSPE / VIVA

		• Diagnose common genetic disorders and mutations. • Analyze pedigrees and assess inheritance patterns. • Interpret results from molecular biology techniques like PCR and sequencing. • Evaluate genetic risks associated with consanguineous marriages. **Attitude Outcome:** • Appreciate the complexity of genetic disorders and mutations. • Recognize ethical issues in genetic testing and privacy. • Develop empathy for patients with genetic conditions. • Stay motivated to keep up with advances in genetics and molecular biology. • Enhance ability to analyze genetic data and its implications.		
IMMUNOLOGY	Innate & acquired Immunity, Antigen, antibody, epitope, hapten Structure and function of major histocompatibility complex (MHC) Cytokines Mechanism of humoral and cell medicated immunity & Cells of Immune System Hypersensitivity reactions, Type I & Type II Hypersensitivity reactions, Type III, Type IV	**Knowledge:** • Define antigen, antibody, epitope, hapten and adhesion molecules. • Differentiate between innate and acquired immunity. • Describe the structure and function at major histocompatibility complex (MHC). • Describe Cytokines. • Describe the mechanism of humoral and cell mediated immunity. • Describe type I, Type II, Type III, and type IV hypersensitivity reactions giving relevant examples.	LGIS Small Group Discussion/ Problem-Based Learning	MCQs / SEQs

	Immunotolerance and immunoparalysis Classification of Immunodeficiency disorders, Basis of autoimmunity & Tissue Immunology: transplantation Pathology and pathogenesis of AIDS Lab diagnosis of immunological diseases Autograft, homograft, allograft and xenograft,	• Define autograft, homograft, allograft and xenograft. • Describe immunotolerance and immunoparalysis. • Classify the immunodeficiency disorders. • Describe the basis of autoimmunity. • Describe tissue transplantation. • Describe the pathology and pathogenesis of AIDS. • Describe the lab diagnosis of immunological diseases. • Discuss various serological diagnostics techniques. **Integration with OMFS** • Discuss the mechanism involved in allograft rejection and steps that can be taken to combat rejection. **Skill:** Describe Lab Diagnosis of Immune Diseases **Attitude:** • **V**alue the intricate nature of immune systems and their components. • Recognize ethical issues in immunological research and treatments. • Develop empathy for patients with autoimmune disorders, hypersensitivities, and immunodeficiencies. • Show motivation to learn about advancements in immunology and related fields. • Enhance skills in analyzing immune responses and diagnosing immunological diseases	Practical	OSPE/ VIVA OSPE/ VIVA

NEOPLASIA	Agenesis, Dysgenesis, Aplasia, Hypoplasia, Metaplasia, Dysplasia, Neoplasia, Anaplasia, Cell cycle and cell types Classification of tumors: Characteristics of benign and malignant tumors with examples, Nomenclature of tumors. Difference between Carcinoma and Sarcoma Oncogenes, proto-oncogenes with examples Mechanism of carcinogenesis & Carcinogenic agents (Radiation, Viral, Chemical & Physical) Routes/Methods of spread of malignant tumors, Importance of sential lymph node biopsy Local & systemic effects of tumors, Paraneoplastic syndrome Tumors markers used in diagnosis & management of cancer Grading & staging of tumors Epidemiology of common cancers in Pakistan & premalignant conditions	**Knowledge** • Define agenesis, dysgenesis, aplasia, hypoplasia, hyperplasia, metaplasia, dysplasia, neoplasia, anaplasia, atrophy and hypertrophy. • Describe the cell cycle and list cell types (stable, labile, permanent). • Explain the mechanisms controlling cell growth. • Compare the characteristics of benign and malignant tumors and the difference between carcinoma and sarcoma. • Describe the biology of tumor growth. • Discuss the process of carcinogenesis. • Describe host defense against tumors. • Discuss the mechanism of local and distant spread of tumor. • Discuss the local and systemic effects of tumors. • Enlist common chemical, physical agents and viruses. **Integration with Oral Pathology** • Describe the classification systems of tumors. • Enlist tumor markers used in the diagnosis and management of cancers. **Integration with OMFS** • Describe the grading and staging system of tumors. • Discuses cancer screening, diagnosis of cancer & their management. **Skill:** • Perform microscopic and gross identification of: ✓ Malignant cell ✓ Benign epithelial tumors ✓ Benign mesenchymal tumors	LGIS Small Group Discussion/ Problem-Based Learning/ Practical	MCQs/ SEQs /OSPE OSPE/ VIVA

	Cancer screening and diagnosis of cancer & Host defense against tumours	✓ Malignant epithelial tumors ✓ Malignant mesenchymal tumors • Identify gross and microscopic features of common benign and malignant neoplasms. ✓ Benign epithelial tumours: ✓ Fibroadenoma breast ✓ Thyroid adenoma ✓ Papilloma ✓ Cyst adenomas ✓ Benign mesenchymal tumors ✓ Leiomyoma ✓ Lipoma ✓ Teratoma/dermoid cyst ✓ Hemangioma **Attitude:** • Identify the various types of tumors and their characteristics. • Analyze carcinogenesis mechanisms and the role of oncogenes and tumor markers. • Develop compassion for cancer patients and awareness of the effects of tumors. • Recognize ethical issues in cancer care and the importance of screening and diagnosis. • Stay updated on advancements in cancer research and treatment.		OSPE/ VIVA
GENERAL BACTERIOLOGY	History of microbiology, general characteristics of microorganisms Morphology of bacteria, gram staining Bacterial classification & structure of bacteria Structure of bacteria Bacterial Genetics: Bacterial genome and its expression, mutation, definition and types	**Knowledge** • Differentiate between prokaryotes and eukaryotes. • Describe general characteristics, morphology, growth of bacteria and culture media. • Describe classification & taxonomy of bacteria. • Define the terms: communicable,	LGIS Small Group Discussion/ Problem-Based Learning/	MCQs / SEQs / OSPE VIVA

	Bacterial Genetics: Methods of DNA transfer within bacterial cells and between various bacteria Bacterial growth including phases of growth & growth curve, classification of bacteria according to temperature & oxygen requirement Culture media (definition & their classification with examples & composition, preparation of culture media) Culture inoculation technique and interpretation of culture report Normal flora, pathogenesis including definitions of communicable disease, epidemic, endemic &pandemic diseases, carriers, pathogens, opportunists, commensals and colonizers, determinants of bacterial pathogenesis, stages of infection Pathogenesis: Microbial mechanisms of invasion & resistance, MOA and differences between exotoxin & endotoxin, biofilms, pathogenicity islands Antibiotics, selective toxicity, bacteriostatic & bactericidal, host determinants in relation to selection of an antimicrobial drug for therapy Mode of action of various antimicrobial	endemic, epidemic, pandemic diseases, carriers, pathogens, opportunists, commensals, colonizers, normal flora, pathogenicity, virulence etc. • Explain microbial mechanisms of invasion and virulence. • Explain hospital acquired or nosocomial infections. • Give universal precautions for infection control. • Explain various mechanisms of gene transfer in bacteria and their application. • Describe various serological diagnostic techniques for infectious diseases. **Integration with Pharmacology:** • Define antibiotic, selective toxicity, broad spectrum & narrow spectrum antibiotic, bacteriostatic and bactericidal drugs, MIC, MBC, superinfection, cross-sensitivity. • Discuss the mechanism of action, adverse effects and mechanisms of resistance of commonly used anti microbial agents in dentistry. **Integration with OMFS** • Differentiate between sterilization &		

	drug groups, superinfection & cross sensitivity MIC & MBC, Bacterial resistance & the mechanisms involved in acquiring bacterial resistance, Mechanisms involved in transfer of drug resistance to bacterial resistance Genetics & non-genetic basis of drug resistance Sterilization & disinfection: Definition, difference, methods of sterilization Sterilization & disinfection: Methods of disinfection (Facility where the doctor practices, Examination table, Any spillage e.g. sputum, vomitus, stool, urine, blood, Examination tools, e.g., thermometer, nasal and ear specula and spatula Sterilization & disinfection: Principles of aseptic techniques such as Venepuncture, urinary catheterization, bandaging, suturing and lumber puncture	disinfection and explain the methods of sterilization & disinfection. • Show understanding of cross infection & its control. **Skill** • Disinfect and sterilize the following: ✓ Facility where the doctor practices ✓ Examination table ✓ Any spillage e.g. sputum, vomitus, stool, urine, blood ✓ Examination tools, e.g., thermometer, nasal and ear specula and spatula • Prepare area for aseptic techniques like: ✓ Venepuncture ✓ Catheterization • Prepare smears from specimens and from culture plates. • Perform gram staining and Z.N staining and interpret results. • Discuss the procedure of sample collection and transport. • Perform complete urine examination: physical, chemical and microscopy and interpret results. • Perform the following practicals: ✓ Study of microscope ✓ Culture media ✓ Sterilization, disinfection & aseptic techniques ✓ Hospital infection prevention & control: ✓ Spill management, hand hygiene,	Practical	OSPE/ VIVA OSPE/ VIVA

		prevention of needle stick injury **Attitude:** • Recognize bacterial diversity and complexity. • Interpret bacterial growth and culture reports. • Show importance of sterilization, disinfection, and aseptic techniques. • Display understanding of ethical issues related to antibiotic use and resistance.		
CLINICAL BACTERIOLOGY	Gram positive cocci: Pathogenesis, Treatment, Epidemiology, Prevention and Control of Staphylococcus Gram positive cocci: Pathogenesis, Treatment, Epidemiology, Prevention and Control of Streptococcus Gram negative cocci: Pathogenesis, Treatment, Epidemiology, Prevention and Control of Neisseria Gram positive rods: Classification, Pathogenesis, Treatment, Epidemiology, Prevention and Control of Bacillus Gram positive rods: Pathogenesis, Treatment, Epidemiology, Prevention and Control of Clostridium Gram positive rods: Pathogenesis, Treatment, Epidemiology, Prevention and Control	**Knowledge:** Describe morphology, cultural characteristics, virulence factors, pathogenesis, epidemiology, treatment, prevention and control of all bacteria that have been listed below: o Staphylococcus o Streptococcus o Neisseria o E. coli o Klebsiella o Salmonella o Shigella o Enterobacter o Citrobacter o Proteus o Bacillus o Corynebacterium diphtheriae o Clostridia o Listeria monocytogenes o Actinomycetes o Vibrio o Campylobacter o Helicobacter o Hemophilus o Bordetella o Legionella o Pseudomonas o Acinetobacter o Mycobacteria	LGIS Small Group Discussion/ Problem-Based Learning	MCQs/ SEQs/ OSPE

	of Corynebacterium, Listeria, Gardenella Pathogenesis, Treatment, Epidemiology, Prevention and Control of Actinomycetes Gram negative rods of Respiratory tract Pathogenesis, Treatment, Epidemiology, Prevention and Control of Haemophilus, Bordetella, Legionella, Mycoplasma Epidemiology, Pathogenesis, Treatment, Prevention & Control of Mycobacterium tuberculosis Epidemiology, Pathogenesis, Treatment, Prevention & Control of Mycobacterium leprae & atypical Mycobacteria Salient features, lab diagnosis including culture & biochemical tests Epidemiology, Pathogenesis, Treatment, Prevention & Control of E.coli Epidemiology, Pathogenesis, Treatment, Prevention & Control of Klebsiella & Enterobacter Epidemiology, Pathogenesis, Treatment, Prevention & Control of Proteus, Morganella& Providencia Epidemiology, Pathogenesis, Treatment, Prevention & Control of Salmonella & Shigella	○ Anaerobes ○ Spirochetes ○ Mycoplasma, Chlamydia, Rickettsia ○ Zoonosis **Integration with Periodontology** Comprehend the pathophysiology of the following micro-organisms: • Streptococcus • Actinomycetes • Mycobacteria Enlist common diseases and their causative microorganisms responsible for the affecting of the following organ systems: ○ Central Nervous System ○ Respiratory System ○ Gastrointestinal System ○ Genital System ○ Urinary System ○ Bones and Joints ○ Zoonosis ○ Skin **Skill:** Perform the biochemical tests that have been listed and interpret positive and negative results: ○ Catalase test ○ Coagulase test ○ DNase test ○ Bile solubility test ○ Bile esculin hydrolysis test ○ Oxidase test ○ TSI ○ Indole test ○ Citrate utilization test ○ Motility test ○ Urease test 1. Identification of AFB in Sputum. 2. Identification of Culture on Lowenstein–Jensen medium.	Practical	OSPE/ VIVA

	Epidemiology, Pathogenesis, Treatment, Prevention & Control of Pseudomonas Epidemiology, Pathogenesis, Treatment, Prevention & Control of Vibrio cholera, Vibrio parahemolyticus, Campylobacter jejuni& Helicobacter pylori Epidemiology, Pathogenesis, Treatment, Prevention & Control of Chlamydia & Rickettsia Epidemiology, Pathogenesis, Treatment, Prevention & Control of Treponema palladium, Leptospira & Borrelia Zoonosis Principles of proper collection and submission of specimens for laboratory investigations, and processing of microbiological specimens Microorganisms responsible for infection of Central Nervous System, Processing of CSF Microorganisms responsible for infection of Respiratory System, Infections of Bones and Joints & Infection of the Skin, Processing of Sputum, Throat Swab & Pus Microorganisms responsible for infection of Gastrointestinal System	○ Identification of α & β hemolysis on blood agar plate. ○ Differentiation of LF and NLF on MacConkey and CLED agar plate. Identify microorganisms on gram staining and culture plates along with performing the following: ○ Gram staining ○ ZN staining and safe processing of sputum sample ○ Catalase test, coagulase test ○ DNase test, oxidase test ○ Biochemical tests-1: TSI, citrate, utilization test ○ Biochemical tests-2: Motility, indole, urease test ○ Urine examination **Attitude:** • Recall bacterial pathogens and their management. • Diagnose and treat infections effectively. • Emphasize on infection prevention and control measures. • Provide compassionate care for patients with bacterial infections. • **Show p**roper specimen handling and understanding of zoonotic diseases.		VIVA

	Microorganisms responsible for infection of Genital System & Urinary System			
PARASITOLOGY	General Parasitology & classification of parasites Intestinal & urogenital protozoa Blood and tissue protozoa Cestodes Trematodes Nematodes	**Knowledge:** Classify parasites. Explain life cycle, mode of transmission, pathogenesis, clinical findings, treatment, prevention and control of the following parasites: o Giardia lamblia o Entamoeba histolytica o Cryptosporidium o Trichomonas vaginalis o Plasmodium species o Leishmania species o Naegleria species o Toxoplasma gondii o Pneumocystis carinii o Ascaris lumbricoides o Ancylostoma duodenale o Necator americanus o Trichuris trichuria o Enterobius vermicularis o Filaria species (Wuchereia) o Strongyloidesstercoralis o Schistosoma species o Echinococcus species o Taenia Solium o Taenia saginata o Diphyllobothrium latum o Hymenolepis nana **Skill:** • Perform stool analysis including physical and microscopic examination and identify cysts / ova. o Stool examination **Attitude:** • Grasp the classification and impact of various parasites. • Diagnose and treat parasitic infections effectively. • Emphasize prevention and control of parasitic diseases.	LGIS Small Group Discussion/ Problem-Based Learning Practical	MCQs /SEQs /OSPE OSPE/ VIVA OSPE/ VIVA

		• Show compassion for patients with parasitic infections. • Exhibit proper specimen handling and the public health significance. • Stay updated on advances in parasitology		
VIROLOGY	General Virology Mumps, measles, rubella Hepatitis A, B, C, D, E Influenza, parainfluenz, RVS Herpes CMV, EBV Rota, rabies Chicken pox HIV	**Knowledge:** • Classify viruses. • Describe mode of replication of viruses. • Describe diagnostic techniques of various viral infections. • Explain morphology general characteristics, pathogenesis, clinical findings, epidemiology, treatment and prevention / control of following viruses: ○ Mumps ○ Herpes ○ Measles ○ Influenza ○ Parainfluenza ○ RSV ○ Hepatitis A, B, C, D, E ○ Rota ○ CMV ○ EBV ○ Rubella ○ Chicken Pox ○ HIV ○ Rabies ○ Dengue ○ Congo ○ Ebola ○ Zika **Integration with Oral Medicine** • Herpes • CMV • EBV • Chicken Pox • HIV **Attitude:** • Gain knowledge of various viruses and their health impacts. • Emphasize the importance of	LGIS Small Group Discussion/ Problem-Based Learning	MCQs/ SEQs/ OSPE OSPE/ VIVA

		vaccination and infection control.		
Basic Mycology **Cutaneous & Subcutaneous Mycoses** **Systemic Mycoses** **Opportunistic Mycoses**		**Knowledge:** • Describe Structure & Growth of fungi • State pathogenesis of diseases caused by various fungi and yeasts • Enlist methods of Laboratory Diagnoses of fungi • Enlist commonly used Antifungal Therapeutic agents • State the mechanism of Action of Antifungal Drugs • Describe the mechanism of Resistance of Antifungal Drugs • State pathogenesis and clinical features of the following Cutaneous Mycoses: ✓ Dermatophytoses ✓ Subcutaneous Mycoses ✓ Sporotrichosis Describe pathogenesis and clinical features of the following opportunistic organisms: ✓ Coccidioides ✓ Blastomyces ✓ Paracoccidioides ✓ Cryptococcus ✓ Mucor & Rhizopus ✓ Pneumocystis ✓ Penicillium Marneffei **Integration with Oral Pathology** Describe pathogenesis and clinical features of the following opportunistic organisms: ✓ Candida ✓ Aspergillus ✓ Histoplasma	LGIS/ Small Group Discussion	MCQs/ SEQs/ OSPE OSPE/ VIVA

		Attitude: • Appreciate the diversity and impact of fungal infections. • Emphasize the importance of preventing and controlling fungal infections.		
Environmental diseases	• Effects of alcohol and smoking	• **Knowledge:** Short-term and long-term physiological and psychological effects of alcohol consumption. Impact on major organs like the liver (cirrhosis), brain (impaired cognitive function), heart, and digestive system. Understanding of addiction and dependency issues related to alcohol (alcoholism). Social and economic consequences, such as impaired judgment leading to accidents and loss of productivity. Legal aspects of alcohol consumption, such as blood alcohol limits for driving. • **Skills:**	LGIS/ Small Group Discussion	MCQs/ SEQs

	• Hazards of radiations	Ability to identify signs of alcohol abuse and addiction. Counseling and intervention techniques for alcohol-related issues. Providing educational information on responsible alcohol use and the dangers of overconsumption. • **Knowledge:** Harmful chemicals in cigarettes (e.g., nicotine, tar, carbon monoxide) and their effect on the body. Link between smoking and diseases like lung cancer, heart disease, stroke, and chronic obstructive pulmonary disease (COPD). Risks of secondhand smoke exposure to non-smokers. Addiction to nicotine and its withdrawal symptoms. Social and economic impacts of smoking on public health. • **Skills:**		

		Assessing smoking habits and dependence on nicotine. Offering guidance for smoking cessation programs (e.g., nicotine replacement therapy, behavioral counseling). Educating individuals and communities on the dangers of smoking and the benefits of quitting. **Attitude:** **Alcohol:** Social Acceptance: Health Awareness: Legal and Religious Restrictions: Recreational Use vs. Problematic Use: Smoking: Decline in Social Acceptance: Health Concerns: Tobacco Industry Criticism: Smoking and Addiction:		

RCoD LAHORE

TOPICS FOR INTEGRATION

S. No.	Topic	Department	Year
1	Repair & Regeneration	Oral Biology	1st Year BDS
2	Wound Healing	OMFS	2nd Year BDS
3	Disorders of Circulation (thrombosis & Embolism, Edema, Hyperemia, Hemostasis, Infarction & Shock)	Physiology	2nd Year BDS
4	Immunology (Autograft, homograft, allograft & xenograft)	OMFS	2nd Year BDS
5	Neoplasia • Classification of Tumours • Tumours Markers • Cancer screening, Diagnosis & Management	Oral Pathology _____ OMFS	2nd Year BDS
6	Virology (Herpes, CMV, EBV, Chicken Pox, HIV)	Oral Medicine	2nd Year BDS
7	General Bacteriology • Sterilization & disinfection (Cross infection and its control)	OMFS	2nd Year BDS
8	Clinical Bacteriology • Streptococcus • Anaerobes	Periodontology	2nd Year BDS
9	Mycology • Candida • Aspergillus • Dimorphic fungi	Oral Pathology	2nd Year BDS
	Correlated Topics with Pathology		
1	**Drugs:** • Anti-Bacterial Drugs • Anti-Inflammatory Drugs • Anti-Parasitic Drugs • Anti-Viral Drugs • Anti-Fungal Drgs • Chemotherapy Drugs	Pharmacology	2nd Year BDS
2	**Neoplasia:** Oral Cancer Sterilization and disinfection	Community & Preventive Dentistry	2nd Year BDS

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DEPARTMENTAL INVOLVEMMENT IN INTEGRATED TEACHINGS

	1ST YEAR	2ND YEAR	3RD YEAR	4th YEAR	EXTRA COURSES
Subject	**Oral Biology**		**OMFS**		
Topic	Healing & Repair		Healing & Repair		
SLOs	• Differentiate between repair & regeneration • Discuss the phases of wound healing		• Anticipate the physiological intervention. • Enlist phases of wound healing factors influencing them.		
Subject	**Physiology**				
Topic	Inflammation				
SLOs	• Inflammation and WBC's				
Subject			**Oral Pathology**		
Topic			General Virology		
SLOs			Classification of Viruses		
Subject			**Periodontology**		
Topic			Normal Flora		
SLOs			• Describe characteristics of biofilm bacteria. • Describe host-microbe interaction • Recognize which bacteria are present in the oral cavity as commensals • Differentiate micro-organisms responsible for various diseases Recognize which non-bacterial organisms are present in the oral cavity.		

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ASSESSMENT

Exam Component	Marks
Internal Assesment	**20**
Summative Assessment **Theory** **a. SEQs: 15 (**03 marks each) **b. MCQs. 45 (**01 mark each) **Total**	 45 45 **90**
VIVA & OSPE **Viva** **a. Observed Stations:** There are 3 observed stations; 05 marks each **b. Non-Observed Stations:** There are 10 non - observed stations; 03 marks each **Total**	 **45** 15 30 **45**

LEARNING RESOURCES

RECOMMENDED READING

1. Kumar, Cortan, Robbins. Pathological Basis of Disease. 9th Ed. W.B. Saunders.

2. Levinson, Jawetz. Medical Microbiology and Immunology. 9th Ed. Mc Graw-Hill.

3. Jorde. Medical Genetics. 3rd Ed. Mosby.

4. AH Nagi. Clinical Pathology Interpretations.

REFERENCE BOOKS

1. James CE Underwood, Simon S Cross. General and Systematic Pathology: with STUDENT CONSULT Access. 5th Ed.

2. JB Walter, MS Israel. General Pathology. 7th Ed.

3. David Lowe. General Pathology: Vivas- Questions You Will be Asked.

4. Nicholas P. Money. Microbiology: A Very Short Introduction (Very Short Introductions)

5. Monica Cheesbrough. Medical Laboratory Manual for Tropical Countries: v.2: Microbiology.

RAHBAR COLLEGE
OF DENTISTRY

Department of Pharmacology

Study Guide

2026

WELCOME NOTE

Dear Second Year BDS Students,

Welcome to another exciting year of learning and growth!

As you embark on this journey, we are thrilled to present your study guide, designed to support your academic success and deepen your understanding Pharmacology. Embrace the challenges ahead, collaborate with your peers, and remember that each step you take brings you closer to becoming a skilled dental professional. Let's make this year memorable and impactful together

Dr. Faiza Khan
Head, Department of Pharmacology

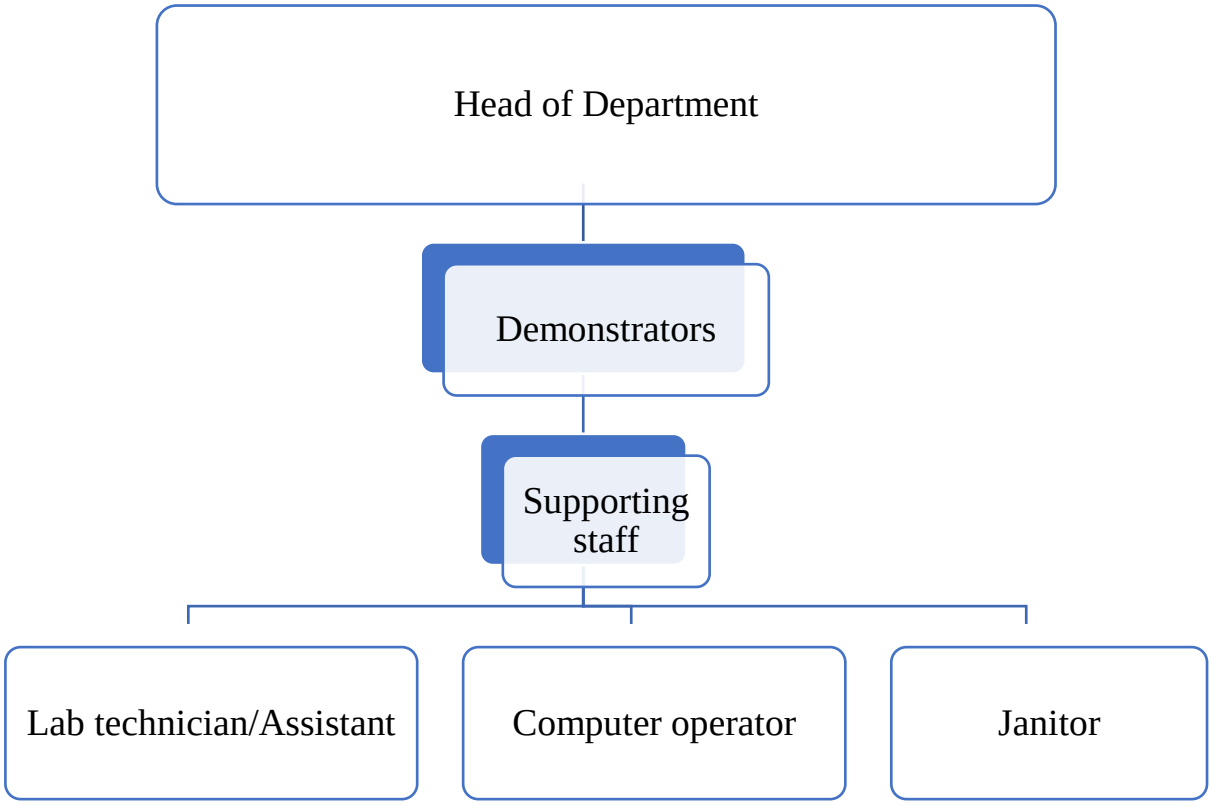
RATIONALE FOR THE COURSE

The pharmacology course for second-year BDS students is essential for developing a comprehensive understanding of the medications used in dental practice. This course equips students with the knowledge of drug classifications, mechanisms of action, therapeutic uses, and potential side effects, enabling them to make informed decisions in patient care. Understanding pharmacology is crucial for safe prescribing, managing drug interactions, and ensuring effective pain management. By integrating pharmacological principles with clinical practice, students will enhance their ability to provide holistic dental care and improve patient outcomes.

DEPARTMENTAL DETAILS

Head of the department	Dr Faiza Khan
Total Lectures	180
Practical/ SGDs	36

DEPARTMENTAL ORGANOGRAM



COURSE INSTRUCTORS

Sr No	Name	Designation
1	Dr Faiza Khan	Associate Prof/ HOD
2		Demonstrator
3		Demonstrator

LIST OF PRACTICAL

Sr. No.	Topics
1.	Labelling and wrapping
2.	Dosage forms
3.	Solutions “Dextrose in Saline”
4.	Mixtures “Carminative Mixture”
5.	Lotions “KMNO4 Lotion
6.	Powders “ORS”
7.	Powders “APC”
8.	Ointments “Sulphur Ointments”

COURSE LEARNING OBJECTIVES

Topic	Learning Outcomes By the end of each section, students will be able to	MIT	Mode of Assessment
General Pharmacology	• Define the historical development of pharmacology, including key milestones and contributors to the field. • Enlist the different branches and divisions of pharmacology, such as pharmacokinetics, pharmacodynamics, and toxicology. • Enlist the concept of active principles in vegetable drugs, including examples and their pharmacological significance. • Classify various dosage forms of drugs and explain the factors that determine appropriate doses for different forms. • Compare different routes of drug administration and explain how they affect drug absorption and bioavailability. • Enlist the processes involved in drug absorption and the factors that influence it. • List and explain the factors that modify drug absorption, including physiological and pathological conditions. • Write the phases of drug biotransformation and the enzymes involved in these processes. • Identify and list the factors that influence drug biotransformation, including genetic and environmental factors. • Define bioavailability and discuss its clinical significance, including factors that affect bioavailability. • Name the processes involved in drug excretion, including the concept of drug clearance. • Outline the concept of drug half-life and its clinical significance in determining dosing regimens. • Identify and explain the mechanisms through which drugs exert their effects on the body. • Enlist the factors that modify drug actions and doses, including drug interactions, patient characteristics, and disease states.	LGIS	MCQs, SEQs, VIVA
	Skill • Narrate in five points the evolution of pharmacology and apply historical insights to understand modern pharmacological practices. • Distinguish between the branches of pharmacology and apply appropriate principles to specific pharmacological problems or cases.	Practical	OSPE

	• Isolate and characterize active principles from vegetable drugs using laboratory techniques. • Calculate appropriate doses for different dosage forms based on patient-specific factors and drug properties. • Select the most appropriate route of administration for a given drug and patient scenario to optimize therapeutic outcomes. • Conduct experiments to assess drug absorption under different conditions and analyze the results. • Evaluate the impact of various factors on drug absorption and adjust dosing regimens accordingly. • Analyze the distribution of a drug in the body, including protein binding, and predict its therapeutic and toxic effects. • Conduct studies to evaluate the biotransformation of drugs and interpret the results to guide therapeutic decisions. • Assess the influence of genetic and environmental factors on drug metabolism and adjust treatment plans as needed. • Measure the bioavailability of a drug in different formulations and apply this knowledge to optimize patient care. • Monitor drug excretion in patients and use the data to adjust dosing for optimal therapeutic effects. • Determine the half-life of drugs in clinical scenarios and use this information to design appropriate dosing schedules. • Identify and manage factors that modify drug actions and doses in clinical practice to ensure safe and effective therapy.		
	Attitude • Time management • Communication skills • Attendance • Active listening • Problem solving • Leadership	Practical/ SGD	OSPE
Autonomic Nervous System	**Knowledge** • Outline briefly the structure and function of the autonomic nervous system (ANS), including its role in regulating involuntary physiological processes. • Differentiate between the sympathetic and parasympathetic divisions of the ANS and their respective neurotransmitters.	LGIS	MCQs, SEQs, VIVA

	• Identify the key catecholamines (e.g., adrenaline, noradrenaline, dopamine) and describe their physiological roles and pharmacological effects. • Write down steps in the synthesis, storage, release, and inactivation of catecholamines in the body. • Enlist the pharmacological properties of non-catecholamine adrenergic drugs and their therapeutic applications. • Differentiate between catecholamines and non-catecholamines in terms of their receptor selectivity, duration of action, and clinical uses. • Outline the mechanism of action of alpha receptor blockers and their effects on blood vessels and other tissues. • List the therapeutic uses and potential side effects of alpha receptor blockers. • Enlist the different types of adrenergic blockers (alpha, beta) and their effects on the cardiovascular system. • Enlist the clinical applications of adrenergic blockers in the treatment of hypertension, heart disease, and other conditions. • Write down the mechanism of action of central sympatholytic drugs and their impact on the central nervous system. • Enlist the therapeutic uses and side effects of central sympatholytic in managing hypertension. • Identify the key cholinergic drugs and write down their mechanisms of action on muscarinic and nicotinic receptors. • What are the therapeutic applications of cholinergic drugs in conditions such as glaucoma, myasthenia gravis, and Alzheimer's disease. • State the mechanism of action of anti-cholinesterase drugs and their role in increasing acetylcholine levels at synapses. • Enlist the uses of oximes in the treatment of organophosphate poisoning and their mechanism of action. • Enlist the pharmacological effects of cholinergic blockers (anticholinergics) and their clinical applications in conditions such as asthma, motion sickness, and Parkinson's disease. • Explain the pharmacology of semisynthetic anticholinergics and their advantages over natural anticholinergic drugs.		

	• List the therapeutic uses and potential side effects of semisynthetic anticholinergics. • State the classification and mechanism of action of skeletal muscle relaxants, including depolarizing and non-depolarizing agents. • Enlist the clinical uses of skeletal muscle relaxants in surgery and the management of spasticity.		
	Skill • Analyze case studies to determine the role of the ANS in various physiological and pathological conditions. • Apply knowledge of ANS pharmacology to predict the effects of specific drugs on autonomic function. • Evaluate the therapeutic effectiveness of catecholamine drugs in emergency situations such as anaphylaxis and cardiac arrest. • Conduct experiments to observe the physiological effects of catecholamines on cardiovascular function in laboratory settings. • Compare the clinical efficacy of non-catecholamine adrenergic drugs in the treatment of asthma, shock, and other conditions. • Develop treatment plans that incorporate non-catecholamine drugs for specific patient scenarios. • Monitor patient responses to alpha receptor blockers and adjust dosing based on therapeutic outcomes and side effects. • Interpret clinical data to optimize the use of alpha blockers in managing conditions such as hypertension and benign prostatic hyperplasia. • Assess the cardiovascular effects of adrenergic blockers in patients with hypertension or arrhythmias. • Manage the side effects of adrenergic blockers in patients, including strategies for minimizing adverse reactions. • Prescribe central sympathoplegics in appropriate clinical situations and monitor their impact on blood pressure and heart rate. • Identify potential drug interactions with central sympathoplegics and modify treatment plans accordingly.	Practical	OSPE
	Attitude • Time management • Communication skills • Attendance	Practical	OSPE

	• Active listening • Problem solving • Leadership		
Central Nervous System	**Knowledge** • State the processes of central neurotransmission, including the synthesis, release, receptor interaction, and inactivation of neurotransmitters in the central nervous system (CNS). • Name the major neurotransmitters involved in central neurotransmission, such as glutamate, GABA, dopamine, serotonin, and acetylcholine, and their roles in various CNS functions. • State the mechanisms of action of general anesthetics, including their effects on the CNS and how they produce unconsciousness, analgesia, and muscle relaxation. • Classify different types of general anesthetics (inhalational and intravenous) and discuss their pharmacokinetics, clinical uses, and potential side effects. • Narrate the mechanism of action of local anesthetics, including their effect on sodium channels and nerve conduction. • State the pharmacokinetics, clinical applications, and potential toxicities of commonly used local anesthetics. • Differentiate between sedatives and hypnotics based on their pharmacological effects, mechanisms of action, and therapeutic uses. • Narrate the mechanisms of action of antiepileptic drugs (AEDs) and describe how they modify neuronal excitability and seizure activity. • Classify antiepileptic drugs based on their mechanisms and discuss their clinical indications, pharmacokinetics, and adverse effects. • Narrate the mechanisms of action of different classes of antidepressants, including SSRIs, SNRIs, TCAs, and MAOIs, and their effects on neurotransmitter systems. • Enlist the therapeutic uses, side effects, and potential interactions of antidepressants in the treatment of depression and other mood disorders. • State the pathophysiology of migraine and explain how various classes of drugs, such as triptans, ergotamines, and prophylactic agents, are used to treat and prevent migraine attacks. • State the pharmacokinetics, clinical uses, and side effects of drugs used in the management of migraine. **Skills:**	LGIS	MCQs, SEQs, VIVA

	• Apply knowledge of central neurotransmission to analyze the effects of drugs that modulate neurotransmitter systems in various neurological and psychiatric conditions. • Interpret clinical cases involving neurotransmitter dysfunction and select appropriate pharmacological interventions. • Evaluate the pharmacological profiles of different general anesthetics and adjust dosages based on patient-specific factors such as age, weight, and comorbidities. **Attitude:** • Time management • Communication skills • Attendance • Active listening • Problem solving • Leadership	Practical Practical	OSPE, VIVA OSPE, VIVA

Topic	Learning Outcomes By the end of each section, students will be able to	MIT	Mode of Assessment
Chemotherapy	**Knowledge:** • Enlist basic principles of chemotherapy, including selective toxicity, spectrum of activity, and the difference between bactericidal and bacteriostatic agents. • Restate the concept of combination therapy and its advantages in preventing resistance and achieving synergistic effects. • Identify the mechanisms by which microorganisms develop resistance to antimicrobial agents, including enzymatic degradation, target site modification, and efflux pumps. • Underline the clinical implications of antimicrobial resistance and strategies to prevent its development. • Write the mechanism of action of sulfonamides and their role in inhibiting folic acid synthesis in bacteria. • Outline the pharmacokinetics, clinical uses, and adverse effects of sulfonamides. • Enlist the synergistic action of trimethoprim and sulfamethoxazole (co-trimoxazole) in inhibiting bacterial folic acid synthesis. • Enlist the therapeutic applications, pharmacokinetics, and potential side effects of co-trimoxazole. • Classify different types of penicillins and enlist their clinical uses, including in dental infections. • State the mechanism of action, spectrum of activity, and clinical applications of cephalosporins, including their use in patients with penicillin allergies. • Write down the classification of cephalosporins into generations and their respective pharmacokinetic properties. • State the mechanism of action of macrolides and their role in inhibiting bacterial protein synthesis. • Enlist the clinical uses, particularly in treating respiratory infections and dental infections, and potential side effects of macrolides. • Identify the broad-spectrum activity of tetracyclines and their mechanism of action in inhibiting bacterial protein synthesis. • Enlist the clinical uses of tetracyclines, including their use in treating acne and periodontal disease and side effects.	LGIS	MCQs, SEQs, VIVA

	• State the mechanism of action of chloramphenicol and its role as a broad-spectrum antibiotic. • Enlist the clinical applications, pharmacokinetics, and potential toxicities, including the risk of aplastic anemia, associated with chloramphenicol. • Write down the mechanism of action of aminoglycosides and their role in treating severe gram-negative infections. • State the mechanism of action of quinolones, including their inhibition of bacterial DNA gyrase and topoisomerase IV. • Identify the first-line drugs used in the treatment of tuberculosis and state their mechanisms of action. • What is the importance of combination therapy in tuberculosis to prevent resistance and enlist the major side effects of antituberculosis drugs. • State the mechanism of action of antiviral drugs used in the treatment of oral viral infections, such as herpes simplex. • Enlist the clinical applications and potential side effects of antiviral drugs in dental practice, including acyclovir. • State the mechanisms of action of different classes of antimalarial drugs, including chloroquine and artemisinin. • Enlist the clinical uses, resistance issues, and side effects associated with antimalarial therapy. • State the mechanism of action of antiamoebic drugs, including metronidazole, and their role in treating amoebic infections. • Enlist the clinical uses, pharmacokinetics, and potential side effects of antiamoebic drugs. • State the classification of antineoplastic agents, their clinical applications, and the significant side effects associated with cancer chemotherapy.		
	Skill: • Apply the principles of chemotherapy to design effective treatment regimens for bacterial, viral, fungal, and protozoal infections. • Analyze case studies to determine the most appropriate antimicrobial therapy based on the pathogen • Evaluate the effectiveness of antimicrobial therapy in the presence of resistant organisms and develop strategies to overcome resistance.	Practical/ SDG	OSPE

	• Conduct laboratory tests to identify resistant strains and recommend alternative therapies based on susceptibility patterns. • Prescribe sulfonamides appropriately, considering their spectrum of activity and potential for adverse effects. • Monitor patient responses to sulfonamide therapy and adjust dosing based on therapeutic outcomes and side effects. • Prescribe co-trimoxazole in the treatment of infections such as urinary tract infections and monitor for potential side effects, such as hypersensitivity reactions. • Adjust treatment regimens based on patient response and laboratory results, such as renal function tests. • Administer penicillin therapy in clinical settings, monitoring for therapeutic efficacy and potential allergic reactions. • Adjust dosing regimens in patients with renal impairment or other comorbidities to prevent toxicity. • Prescribe cephalosporins in appropriate clinical situations, including patients with penicillin allergies, and monitor for therapeutic outcomes. • Manage potential adverse effects of cephalosporins, such as gastrointestinal disturbances or allergic reactions. • Prescribe macrolides for infections where they are indicated, particularly in cases of penicillin allergy, and monitor for therapeutic effectiveness. • Adjust macrolide therapy based on patient-specific factors, such as drug interactions and liver function. • Administer tetracyclines in clinical settings, monitoring for signs of effectiveness and side effects such as photosensitivity or gastrointestinal disturbances. • Evaluate patient adherence to tetracycline therapy and provide counseling on the importance of avoiding certain foods or supplements that may interact with the drug. • Administer chloramphenicol in situations where it is indicated and monitor closely for signs of toxicity, particularly bone marrow suppression. • Manage patient care to prevent and address potential side effects of chloramphenicol therapy, such as monitoring blood counts. • Administer aminoglycosides in hospital settings, monitoring for therapeutic efficacy and signs of nephrotoxicity and ototoxicity. • Adjust aminoglycoside dosing based on therapeutic drug monitoring (TDM) and patient-specific factors such as renal function.		

	• Prescribe quinolones for appropriate bacterial infections and monitor for therapeutic effectiveness and potential side effects like tendonitis. • Educate patients on the importance of adherence to quinolone therapy and potential drug-food interactions. • Initiate and manage combination therapy for tuberculosis, monitoring for adherence and signs of drug resistance. • Adjust treatment regimens based on patient response and side effects, including hepatotoxicity and peripheral neuropathy. • Prescribe antifungal agents for oral infections such as candidiasis, and monitor for therapeutic efficacy and potential side effects. • Provide patient education on the proper use of antifungal medications and the importance of oral hygiene in preventing fungal infections.		
	Attitude: • Time management • Communication skills • Attendance • Active listening • Problem solving • Leadership	Practical/ SGD	OSPE

CVS	**Knowledge:** • State the pathophysiology of congestive cardiac failure and the role of various drug classes (e.g., diuretics, ACE inhibitors, beta-blockers, and aldosterone antagonists) in its management. • State the mechanisms of action, therapeutic uses, and potential side effects of drugs commonly used in the treatment of CCF, including digoxin, diuretics, and vasodilators. • Identify the clinical indications for the use of specific drugs in different stages and types of CCF. **Antiarrhythmic Drugs** • Classify antiarrhythmic drugs according to the Vaughan Williams classification and describe their mechanisms of action. • State the pharmacokinetics, therapeutic uses, and potential side effects of commonly used antiarrhythmic drugs, such as amiodarone, lidocaine, and beta-blockers. • Enlist the clinical indications for different classes of antiarrhythmic drugs and their use in managing various arrhythmias. **Antihypertensive Drugs** • Classify antihypertensive drugs based on their mechanisms of action and describe their role in the management of hypertension. • Enlist the pharmacological effects, therapeutic uses, and potential adverse effects of major classes of antihypertensive drugs, including ACE inhibitors, ARBs, calcium channel blockers, diuretics, and beta-blockers. • Identify the appropriate antihypertensive therapy based on patient-specific factors such as comorbidities and demographic characteristics. **Antianginal Drugs/Drugs Used in Myocardial Infarction (MI)** • Describe the pathophysiology of angina pectoris and myocardial infarction and the role of various drug classes (e.g., nitrates, beta-blockers, calcium channel blockers, and antiplatelet agents) in their management. • State the mechanisms of action, therapeutic uses, and potential side effects of drugs used in the treatment of angina and MI, including nitroglycerin, aspirin, and statins. • State the use of combination therapy in managing chronic stable angina and acute coronary syndromes, including MI.	LGIS	MCQs, SEQs, VIVA

	Skill: • Write pharmacotherapy for patients with CCF, including the use of diuretics, ACE inhibitors, and beta-blockers, while monitoring for therapeutic efficacy and side effects. • Adjust drug dosages in patients with CCF based on clinical response, renal function, and potential drug-drug interactions. • Evaluate the need for additional therapies or adjustments in treatment plans based on patient symptoms, laboratory results, and overall cardiac function. **Antiarrhythmic Drugs** • Pen down antiarrhythmic drugs in clinical settings, how to monitor for effectiveness in controlling arrhythmias and manage potential side effects, such as proarrhythmia. • Interpret ECG findings to assess the effectiveness of antiarrhythmic therapy and adjust treatment regimens accordingly. • Counsel patients on the importance of adherence to antiarrhythmic therapy and educate them on recognizing signs of drug toxicity or adverse effects. **Antihypertensive Drugs** • Prescribe antihypertensive therapy tailored to individual patient needs, considering factors such as age, comorbidities, and risk of adverse effects. • Monitor blood pressure and other relevant parameters to assess the effectiveness of antihypertensive therapy and adjust dosages or drug combinations as necessary. • Educate patients on lifestyle modifications that complement antihypertensive therapy and counsel them on adherence to prescribed medications. **Antianginal Drugs/Drugs Used in Myocardial Infarction (MI)** • Enumerate antianginal drugs for acute settings, such as during an angina attack or MI, and monitor for therapeutic efficacy and side effects. • Write management of chronic stable angina or post-MI patients, including the use of nitrates, beta-blockers, and antiplatelet agents. • Evaluate patient progress and adjust treatment plans based on symptom control, exercise tolerance, and overall cardiovascular health.		

	Attitude: • Time management • Communication skills • Attendance • Active listening • Problem solving • Leadership	Practical	OSPE
Diuretics	**Knowledge:** • State the general mechanism of action of diuretics and their role in managing conditions like hypertension, edema, and heart failure. • Classify diuretics based on their site of action in the nephron and their specific mechanisms of action. • Enlist the therapeutic uses, pharmacokinetics, and potential side effects of different classes of diuretics. **Thiazide Diuretics** • State the mechanism of action of thiazide diuretics, particularly their effect on sodium and chloride reabsorption in the distal convoluted tubule. • Enlist the clinical applications of thiazide diuretics, especially in the treatment of hypertension and edema, and their potential side effects, such as hypokalemia. • Enlist the differences between thiazides and other classes of diuretics in terms of efficacy, duration of action, and side effects. **Loop Diuretics** • State the mechanism of action of loop diuretics, focusing on their inhibition of sodium-potassium-chloride cotransport in the thick ascending limb of the loop of Henle. • Enlist the clinical indications for loop diuretics, including their use in acute pulmonary edema, heart failure, and chronic kidney disease, and potential side effects such as electrolyte imbalances. • Compare the effectiveness of loop diuretics with other diuretic classes in managing fluid overload. **Potassium-Sparing Diuretics** • State the mechanism of action of potassium-sparing diuretics, including their effect on sodium channels and aldosterone receptors in the distal nephron.	LGIS	MCQs, SEQs, VIVA

	• Enlist the clinical uses of potassium-sparing diuretics, particularly in combination with other diuretics to prevent hypokalemia, and their potential side effects, such as hyperkalemia. • Differentiate between the mechanisms of action and clinical applications of aldosterone antagonists (e.g., spironolactone) and sodium channel blockers (e.g., amiloride). **Miscellaneous Diuretics** • State the mechanisms of action and clinical uses of miscellaneous diuretics, such as carbonic anhydrase inhibitors and osmotic diuretics. • Enlist the therapeutic indications for these diuretics, such as carbonic anhydrase inhibitors in glaucoma or osmotic diuretics in managing increased intracranial pressure. • Enlist the potential side effects and contraindications associated with the use of miscellaneous diuretics.		
	Skill: • Apply knowledge of diuretic classifications to select the most appropriate diuretic based on the patient's condition, comorbidities, and electrolyte balance. • Evaluate patient responses to diuretic therapy and adjust treatment regimens based on clinical outcomes and laboratory results. **Thiazide Diuretics** • Prescribe thiazide diuretics for the management of hypertension and monitor for therapeutic effectiveness and potential side effects, such as electrolyte disturbances. • Counsel patients on the importance of adhering to thiazide therapy and educate them on recognizing signs of electrolyte imbalances, such as muscle weakness or cramps. **Loop Diuretics** • Administer loop diuretics in acute care settings for conditions like pulmonary edema and monitor for rapid changes in fluid and electrolyte status. • Adjust the dosage of loop diuretics based on patient-specific factors, such as renal function,	Practical	OSPE

	and manage potential side effects, including monitoring serum electrolytes and renal function. **Potassium-Sparing Diuretics** • Prescribe potassium-sparing diuretics in combination with other diuretics to mitigate the risk of hypokalemia and monitor for signs of hyperkalemia. • Educate patients on dietary considerations and the importance of avoiding potassium supplements or high-potassium foods while on potassium-sparing diuretics. **Miscellaneous Diuretics** • Administer carbonic anhydrase inhibitors or osmotic diuretics in specific clinical scenarios, such as managing glaucoma or cerebral edema, and monitor for effectiveness and side effects. • Evaluate the need for continued use of miscellaneous diuretics based on therapeutic response and patient-specific factors, such as acid-base balance and renal function.		
	Attitude: • Time management • Communication skills • Attendance • Active listening • Problem solving • Leadership	Practical	OSPE

Endocrinology	**Knowledge:** **1. Antidiabetic Drugs** • State the pathophysiology of diabetes mellitus and the role of different classes of antidiabetic drugs in its management. • State the mechanisms of action, therapeutic uses, and potential side effects of oral hypoglycemic agents, including sulfonylureas, biguanides, and DPP-4 inhibitors. • Differentiate between the various types of insulin preparations and their clinical applications in managing type 1 and type 2 diabetes. • Identify the indications for combination therapy in diabetes management and the rationale behind using multiple drug classes together. **2. Thyroid Hormones** • State the physiological roles of thyroid hormones and the consequences of hypothyroidism and hyperthyroidism. • Narrate the mechanisms of action, pharmacokinetics, and therapeutic uses of synthetic thyroid hormones (e.g., levothyroxine) in treating hypothyroidism. • Enlist the uses of antithyroid drugs, such as propylthiouracil and methimazole, in the management of hyperthyroidism, including potential side effects. **3. Corticosteroids** • State the mechanisms of action of corticosteroids, including their anti-inflammatory and immunosuppressive effects. • Enlist the therapeutic uses of corticosteroids in various clinical conditions, such as asthma, autoimmune diseases, and adrenal insufficiency. • Identify the potential side effects of long-term corticosteroid use, including Cushing's syndrome, osteoporosis, and adrenal suppression. **4. Oral Contraceptives** • State the mechanisms of action of combined oral contraceptives (COCs) and progestin-only pills in preventing pregnancy.	LGIS	MCQs, SEQs, VIVA

	• Narrate the pharmacokinetics, therapeutic uses, and potential side effects of oral contraceptives, including their impact on the menstrual cycle and risk of thromboembolism. • Enlist the non-contraceptive benefits of oral contraceptives, such as managing menstrual disorders and reducing the risk of certain cancers.		

	Skill: **1.Antidiabetic Drugs** • Prescribe appropriate antidiabetic therapy based on individual patient needs, considering factors such as type of diabetes, glycemic control, and comorbidities. • Monitor blood glucose levels and HbA1c in patients on antidiabetic therapy and adjust treatment regimens based on therapeutic outcomes and side effects. • Educate patients on the importance of medication adherence, lifestyle modifications, and regular monitoring to effectively manage diabetes. **2.Thyroid Hormones** • Initiate and manage thyroid hormone replacement therapy in patients with hypothyroidism, monitoring for therapeutic efficacy and potential side effects. • Adjust dosing of thyroid hormones based on clinical response and laboratory results, such as TSH levels. • Educate patients on the importance of consistent medication use and potential interactions with other drugs or foods that may affect thyroid hormone levels. **3.Corticosteroids** • Pen down corticosteroid therapy in acute and chronic conditions, monitoring for therapeutic effectiveness and managing potential side effects. • Taper corticosteroid dosages appropriately to avoid adrenal suppression and educate patients on the risks of long-term corticosteroid use. • Recognize and manage adverse effects of corticosteroid therapy, such as hyperglycemia, hypertension, and osteoporosis. 4. **Oral Contraceptives** • Prescribe oral contraceptives based on patient-specific factors, such as age, smoking status, and risk of thromboembolism. • Counsel patients on the correct use of oral contraceptives, including missed doses and managing side effects.	**Practical**	**OSPE**

	• Monitor patients on long-term oral contraceptive therapy for potential adverse effects and adjust therapy as necessary		
	Attitude: • Time management • Communication skills • Attendance • Active listening • Problem solving • Leadership	Practical	OSPE

Topic	Learning Outcomes At the end of each topic student will be able to	MIT	Mode of Assessment
Opioids	**Knowledge:** • State the origin, history, and pharmacological significance of Morphine as a natural opioid. • Classify opioids into natural, semisynthetic, and synthetic categories with specific examples of each. • Narrate chemical modifications that differentiate semisynthetic opioids (e.g., heroin, oxycodone) from synthetic opioids (e.g., fentanyl, methadone). • State the mechanism of action of morphine and its derivatives at the opioid receptors, specifically the mu receptor. • Enlist the clinical applications, benefits, and potential risks (e.g., addiction, tolerance) associated with the use of morphine and its synthetic/semisynthetic analogs.	LGIS	MCQs, SEQs, VIVA
	Skills • Classify a given list of opioids into natural, semisynthetic, or synthetic categories. • Demonstrate the ability to identify and distinguish between different semisynthetic and synthetic opioids based on their chemical structures and clinical uses. • Present and explain the mechanism of action of morphine and its derivatives through diagrams or models. • Assess and discuss potential risks and benefits associated with opioid therapy, including developing case studies that evaluate patient safety. • Practice explaining the safe use of opioids, including morphine, to patients, highlighting the importance of adherence to prescribed dosages to avoid adverse effects.	Practical	OSPE

	Attitude • Time management • Communication skills • Attendance • Active listening • Problem solving • Leadership	Practical	OSPE
NSAIDs	**Knowledge** • Classify nonsteroidal anti-inflammatory drugs (NSAIDs), including Aspirin and other salicylates, propionic acid derivatives (e.g., ibuprofen, naproxen), acetic acid derivatives (e.g., diclofenac), and paracetamol, based on their chemical structures and therapeutic uses. • State the mechanism of action of Aspirin and other salicylates, particularly their role in inhibiting cyclooxygenase (COX) enzymes and reducing prostaglandin synthesis. • What is the mechanisms of action of propionic acid and acetic acid derivatives, highlighting how they reduce inflammation, pain, and fever by inhibiting COX enzymes. • State the mechanism of action of Paracetamol, particularly its effects on COX enzymes in the central nervous system and its analgesic and antipyretic properties. • Enlist the pharmacological effects, therapeutic uses, and common side effects of Aspirin, other salicylates, propionic acid derivatives, acetic acid derivatives, and Paracetamol.	LGIS	MCQs, SEQs, VIVA
	Skill • Demonstrate the ability to explain and illustrate the mechanisms of action of Aspirin, other salicylates, propionic acid derivatives, acetic acid derivatives, and Paracetamol using diagrams or flowcharts. • Practice determining the appropriate use of specific NSAIDs (e.g., selecting between Aspirin, ibuprofen, diclofenac, and Paracetamol) based on a patient's clinical condition, considering factors like efficacy, side effects, and Students contraindications. • Effectively counsel patients on the safe use of Aspirin, other salicylates, propionic acid derivatives, acetic acid derivatives, and Paracetamol, including instructions on dosing, potential side effects, and drug interactions.	Practical	OSPE
Blood	**Knowledge** • State the role of haematinics (e.g., iron, folic acid, vitamin B12) in the treatment of anemia and the	LGIS	MCQs, SEQs, VIVA

	physiological processes they support in erythropoiesis. • Classify anticoagulants into different categories such as heparin (unfractionated and low molecular weight), oral anticoagulants (e.g., warfarin, direct oral anticoagulants), and explain their mechanisms of action. • State the mechanism of action of oral anticoagulants like warfarin (vitamin K antagonism) and direct oral anticoagulants (e.g., factor Xa inhibitors, direct thrombin inhibitors). • State the mechanisms of action of antiplatelet drugs (e.g., aspirin, clopidogrel), focusing on their role in inhibiting platelet aggregation and preventing arterial thrombosis. • State the mechanism of action of thrombolytic agents (e.g., alteplase, streptokinase), particularly their role in dissolving clots by activating plasminogen to plasmin. • Enlist the clinical applications, therapeutic benefits, and potential adverse effects associated with haematinics, anticoagulants, antiplatelet drugs, and thrombolytics.		
	Skill • Develop the skills to select appropriate haematinics, anticoagulants, or antiplatelet drugs based on patient-specific factors such as the type of anemia, risk of thrombosis, or presence of comorbid conditions, and calculate accurate dosages. • Present through diagrams, including the pathways they influence (e.g., coagulation cascade, platelet aggregation). • Practice managing patients on anticoagulant or antiplatelet therapy, including monitoring therapeutic efficacy, recognizing signs of over- or under-anticoagulation, and adjusting doses accordingly. • Practice educating patients on the proper use of haematinics, anticoagulants, antiplatelet drugs, and thrombolytics, emphasizing the importance of adherence, potential drug interactions, dietary considerations, and what to do in case of missed doses or adverse effects.	Practical	OSPE
	Attitude • Time management • Communication skills • Attendance • Active listening • Problem solving	Practical	OSPE

	• Leadership		
GIT	**Knowledge** • Classify antidiarrhoeal drugs into different categories (e.g., adsorbents, antimotility agents, probiotics, antisecretory agents) and describe their mechanisms of action. • State the mechanisms of action of various antiemetics (e.g., dopamine antagonists, serotonin antagonists, antihistamines) and explain how they inhibit nausea and vomiting through different pathways in the central nervous system. • Classify purgatives (e.g., bulk-forming agents, osmotic laxatives, stimulant laxatives) and understand their mechanisms of action in promoting bowel movements. • Enlist the classes of drugs used in peptic ulcer management, including proton pump inhibitors (PPIs), H2-receptor antagonists, antacids, and antibiotics for H. pylori eradication, along with their mechanisms of action. • Enlist the therapeutic uses, benefits, and potential adverse effects associated with antidiarrhoeals, antiemetics, purgatives, and peptic ulcer drugs.	LGIS	MCQs, SEQs, VIVA
	Skills • Develop the ability to select appropriate antidiarrhoeals, antiemetics, purgatives, or peptic ulcer drugs based on specific patient symptoms, underlying conditions, and potential drug interactions. • Demonstrate the ability to explain the mechanisms of action of antidiarrhoeals, antiemetics, purgatives, and peptic ulcer drugs using diagrams, flowcharts, or oral presentations. • Practice managing clinical cases involving diarrhea, nausea, constipation, or peptic ulcer disease, including the appropriate choice of drug therapy, dosage, and monitoring for efficacy and side effects. • Identify common side effects of antidiarrhoeals (e.g., constipation), antiemetics (e.g., sedation, extrapyramidal symptoms), purgatives (e.g., dehydration), and peptic ulcer drugs (e.g., headache with PPIs) and develop strategies to manage or prevent these effects. **Patient Education and Counseling:** Students will practice counseling patients on the proper use of these drugs, emphasizing the importance of adherence to treatment regimens, recognizing and reporting adverse effects, and understanding dietary and lifestyle modifications that may complement drug therapy.	Practical	OSPE
	Attitude		

	• Time management • Communication skills • Attendance • Active listening • Problem solving • Leadership	Practical	OSPE
Respiration	**Knowledge** • Classify expectorants into different categories (e.g., mucolytics like acetylcysteine, and stimulant expectorants like guaifenesin) and describe their mechanisms of action in facilitating the expulsion of mucus from the respiratory tract. • State the mechanisms of action of antitussives (e.g., opioid antitussives like codeine, and non-opioid antitussives like dextromethorphan) and explain how they suppress the cough reflex. • Classify antiasthmatic drugs into categories such as bronchodilators (e.g., beta-agonists, anticholinergics), anti-inflammatory agents (e.g., corticosteroids), leukotriene modifiers, and others (e.g., theophylline), and explain their mechanisms of action. • Stae the pathophysiology of asthma and how various classes of antiasthmatic drugs act to relieve symptoms and prevent exacerbations. • Enlist the therapeutic uses, benefits, and potential adverse effects of expectorants, antitussives, and antiasthmatic drugs.	LGIS	MCQs, SEQs, VIVA
	Skill • Develop the ability to select appropriate expectorants, antitussives, or antiasthmatic drugs based on patient symptoms, disease severity, and comorbidities. • Demonstrate the ability to explain the mechanisms of action of expectorants, antitussives, and antiasthmatic drugs using visual aids such as diagrams or flowcharts, particularly how they affect the respiratory system. • Practice managing clinical cases involving respiratory conditions such as cough, asthma, or chronic obstructive pulmonary disease (COPD), including the selection of suitable medications, dosage adjustments, and monitoring for therapeutic effectiveness and side effects. • Identify and discuss common side effects associated with expectorants (e.g., gastrointestinal upset), antitussives (e.g., drowsiness with opioid antitussives), and antiasthmatic drugs (e.g., tachycardia with beta-agonists) and develop	Practical	OSPE

	strategies to minimize or manage these effects in patients. • Practice counseling patients on the proper use of expectorants, antitussives, and antiasthmatic drugs, including instructions on inhaler technique, adherence to treatment plans, recognizing and responding to adverse effects, and lifestyle modifications to support respiratory health.		
	Attitude • Time management • Communication skills • Attendance • Active listening • Problem solving • Leadership	Practical	OSPE
Miscellaneous	**Knowledge** • Classify antihistamines into first-generation (e.g., diphenhydramine, chlorpheniramine) and second-generation (e.g., loratadine, cetirizine) and describe their mechanisms of action, particularly their effects on H1 receptors and their impact on allergic reactions. • Enlist the therapeutic uses (e.g., allergic rhinitis, urticaria) and common side effects (e.g., sedation with first-generation antihistamines) associated with different antihistamines. • Classify antiseptics (e.g., chlorhexidine, iodine) and disinfectants (e.g., sodium hypochlorite, hydrogen peroxide) used in dentistry and describe their mechanisms of action in microbial control. • Enlist the applications of various antiseptics and disinfectants in dental procedures and discuss their safety profiles, including potential risks and contraindications. • Enlist different types of drug interactions (e.g., pharmacodynamic, pharmacokinetic) and provide examples of how these interactions can affect drug efficacy and safety. • State the clinical relevance of drug interactions, including how to anticipate, prevent, and manage potential interactions in patient therapy.	LGIS	MCQs, SEQs, VIVA
	Skill • Develop the ability to select appropriate antihistamines based on patient symptoms, medical history, and potential drug interactions, including differentiating between first and second-generation antihistamines. • Practice counseling patients on the proper use of antihistamines, including dosage instructions,	Practical	OSPE

	expected side effects, and potential interactions with other medications or substances. • Practice selecting and applying appropriate antiseptics and disinfectants for various dental procedures, including preparing surfaces, instruments, and managing patient care. • Demonstrate the ability to adhere to safety protocols when using antiseptics and disinfectants, including handling and disposal, to minimize risks to patients and dental staff. • Develop skills in identifying potential drug interactions in clinical scenarios, including reviewing patient medication lists and assessing possible interactions based on pharmacological principles. • Practice managing cases where drug interactions may occur, including adjusting therapy, monitoring for adverse effects, and providing recommendations for alternative treatments or strategies to mitigate interactions.		
	Attitude • Time management • Communication skills • Attendance • Active listening • Problem solving • Leadership	Practical	OSPE

DEPARTMENTAL CONTRIBUTION IN INTEGRATED TEACHING

Sr no.	Topic	Department	Year
1	General pharmacology	Biochemistry	1st year
2	Autonomic Nervous system	Physiology, Biochemistry, Oral Medicine	1st year, 4th year
3	Central Nervous System	Physiology, Pathology, Oral Medicine	1st year, 4th year
4	Chemotherapy	Oral Medicine, Pathology	2nd year,4th year
5	CVS	Physiology, Pathology	1st year, 4th year
6	Diuretics	Physiology, Oral medicine	1st year, 2nd year,4th year
7	Endocrinology	Physiology, Biochemistry, Oral Medicine	1st year, 2nd year, 4th year
8	Opioids	Physiology, Oral Medicine, physiology	1st year, 2nd year, 4th year
9	NSAIDs	Biochemistry, Oral Medicine, Pathology	1st year, 2nd year, 4th year
10	Blood	Physiology, Oral Medicine Pathology	1st year, 2nd year, 4th year
11	GIT	Physiology, Oral Medicine	1st year, 2nd year, 4th year
12	Respiration	Physiology, Oral Medicine	1st year, 2nd year, 4th year
13	Miscellaneous	Physiology, Oral Medicine, OMFS	1st year, 2nd year

ASSESSMENT

Exam Component	Marks
Internal Assesment	**20**
Summative Assessment **Theory** **a. SEQs: 15 (**03 marks each) **b. MCQs. 45 (**01 mark each) **Total**	 45 45 **90**
Viva Voce **a. Internal Examiner:** 30 marks **b. External Examiner:** 30 marks **Total**	 30 30 **60**
OSPE **a. Observed Stations:** There are 2 observed stations **b. Non-Observed Stations:** There are 4 non - observed stations; 04 marks each **c. Copy** **Total**	 09 16 05 **30**

LEARNING RESOURCES

- Basic and Clinical Pharmacology 14th Edition by Bertram Katzung.
- Katzung& Trevor's Pharmacology Examination and Board Review, 12th Edition by Anthony Trevor, Bertram Katzung, Marieke Knuidering-Hall.
- Lippincott Illustrated Reviews: Pharmacology (Lippincott Illustrated Reviews Series) 7th Editionby Karen Whalen PharmD BCPS.
- Goodman & Gilman's: The Pharmacological Basis of Therapeutics, 13 Edition Laurence L. Brunton, RandaHilal-Dandan, Björn C. Knollmann.
- STEP 1 Lecture Notes 2018 USMLE Pharmacology: Published by Kaplan Medical.

RAHBAR COLLEGE
OF DENTISTRY

Department of Behavioral Sciences

Study Guide

2026

RCoD LAHORE

WELCOME NOTE

Dear Students,

Welcome to the Behavioral Sciences course, a key aspect of your academic and professional journey in dentistry. As future dental practitioners, understanding human behavior, communication, and psychology is essential in fostering effective patient relationships, managing stress, and promoting overall oral health. This course has been designed to equip you with the skills needed to interact compassionately and ethically with patients from diverse backgrounds, enhancing your ability to provide holistic care.

We encourage you to actively engage with the material and discussions, as the insights gained from this subject will be instrumental in your clinical practice. Remember that the foundation you build now will serve you throughout your career, ensuring that you not only excel technically but also as empathetic and well-rounded professionals.

Best wishes for a fruitful and enriching learning experience.

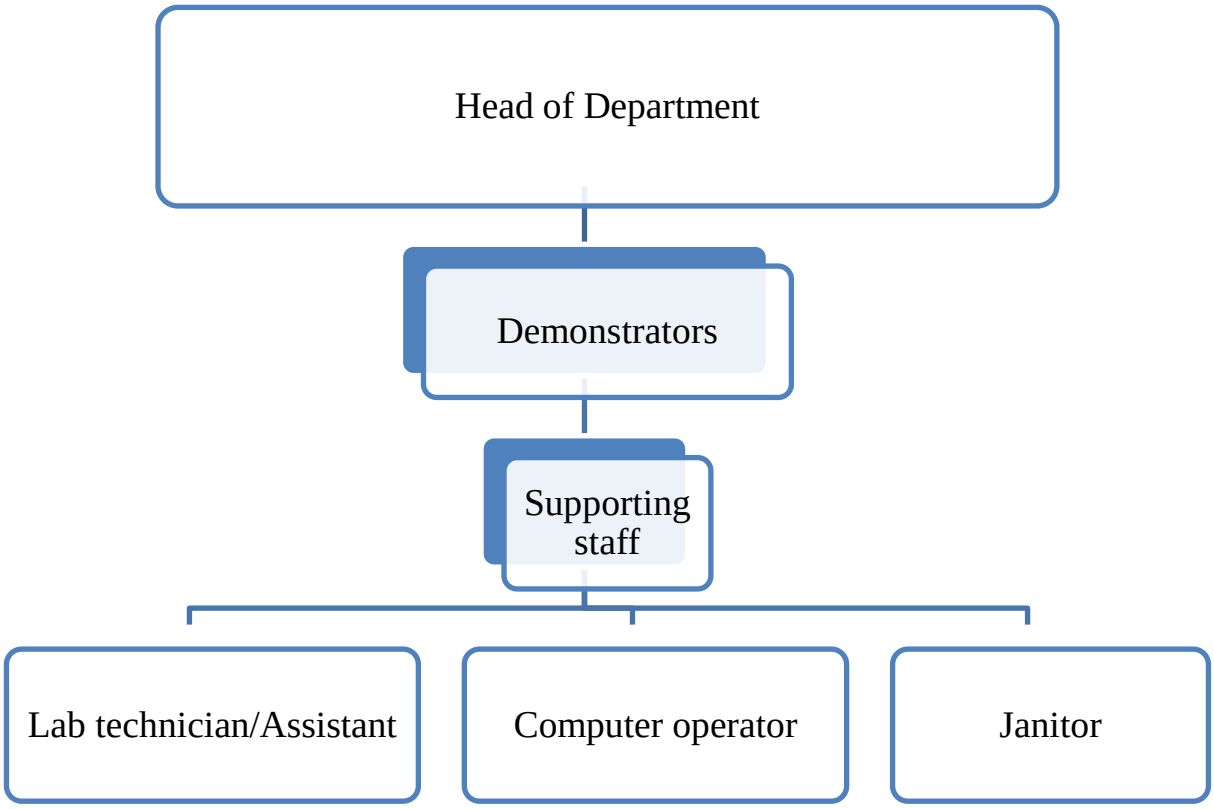
RATIONALE FOR THE COURSE

Behavioral Sciences aims to equip students with the essential skills needed to interact effectively with patients in a clinical setting. These skills include fostering empathy, engaging in active listening, conducting psychosocial assessments, and managing challenging patient interactions. Furthermore, it prepares students to navigate complex situations such as breaking bad news and addressing emotional or psychological concerns with professionalism and sensitivity. By developing these competencies, students will enhance their ability to provide comprehensive, patient-centered care that goes beyond technical expertise, contributing to more positive patient outcomes and stronger practitioner-patient relationships.

DEPARTMENTAL DETAILS

Head of the department	
Study guide developed by	
Total Lectures	108

DEPARTMENTAL ORGANOGRAM



COURSE INSTRUCTORS

Sr. No.	Name	Designation
1		HOD
2		Demonstrator
3		Demonstrator

COURSE LEARNING OBJECTIVES

Topic	Course Content	Learning Outcome At the end of each topic, student will be able to	MIT	Assessment Tool
Introduction	-Introduction to Behavioral Sciences - Holistic VS Traditional Allopathic Medicine - Healthcare Models and their Clinical Applications - Non-Pharmacological interventions (NPIs) in Clinical Practice	-Define "behavioral sciences" -Understand the rationale for studying behavioral sciences -Distinguish between holistic and traditional allopathic medicine -Describe elements of the holistic approach -Define the Biopsychosocial Model, Integrated Model & Public Health Model -Conceptualize patients according to the relevant model(s) -Explain the models using practical/clinical examples -Recognize the strengths & limitations of each model -Identify factors that aid and obstruct communication -Describe various communication skills -Apply these communication skills in practice -Understand the aims of a counselling session -List the traits of an effective counsellor and the do's and don'ts of counselling -Define the 3 "Ds" of Informational Care -Answer the 7 questions of informational care -Formulate an informational care using the 3 Ds and 7 questions -Define empathy -Differentiate between empathy & sympathy -Describe ways of improving empathy -Define "crisis" -Report the common responses to crises -Describe Robert's 7 Stage Model of Crisis Management	LGIS	SEQ/MCQ/OSPE-VIVA

Ethics and Professionalism	-Medical Ethics	-Define ethics, descriptive ethics and normative ethics -Name and explain the 4 pillars of medical ethics -Define informed consent, list exceptions to informed consent and explain the BRAINS acronym for informed consent -Appreciate importance of confidentiality and describe the limits of confidentiality -Define decision-making capacity and recognize when it is compromised -Define euthanasia, malpractice & inclusion of patients in clinical trials -List common ethical dilemmas -Explain the dilemmas surrounding Euthanasia, Gifts from Patients, Sexual Boundaries, Pharmacies, Media/ Telemedicine, and Fees -Respond appropriately to these ethical dilemmas	LGIS SGD Role Play	SEQ/MCQ/OSPE/ VIVA
	-Professionalism	-Elaborate upon the domains of Knowledge, Skills and Attitudes as they relate to Professionalism -Describe and demonstrate aspects of professionalism such as punctuality, professional attire, knowledge of patients and conscientiousness	LGIS SGD	SEQ/MCQ/OSPE/ VIVA
	-Doctor- Patient Relationship	-Explain the 3 models of doctor-patient relationships (vertical, student teacher, horizontal) -Recognize dangers to the doctor-patient relationship -Describe the rights and responsibilities of patients and doctors respectively -Identify and explain common reactions including social bonding, transference/ countertransference, dependence, resistance & physician burn out -List signs of each of these reactions and describe management of such reactions	LGIS SGD Role Play	SEQ/MCQ/OSPE/ VIVA

Psychology in Medical Practice	-Role of Psychology Medical Practice	-Explain the role of psychological factors in the etiology, onset and management of health conditions -Discuss the role of psychological factors in patients' reactions to illness and in the cause of disability, handicap and stigma -Understand the phenomenon of MUS (Medically Unexplained Symptoms)	LGIS/ SGD	SEQ/MCQ/OPSE VIVA
	-Principles of Psychology (Learning, Perception, Motivation, Metacognition, Thinking, Memory, Emotions, Intelligence, Personality)	-Define operant conditioning, classical conditioning, shaping and modelling with examples -Describe and demonstrate the use of these concepts in clinical settings -Define metacognition -List metacognitive strategies for learning -Describe the planning, monitoring and evaluating phases of learning -List and explain the 3 stages of memory -List strategies for improving memory -Identify pathologies of memory -Define perception -Describe links between perception & motivation & perception & attention -Define basic perceptual abilities with examples -Define concepts and problem-solving -Elaborate upon problem-solving methods (algorithms, heuristics) -Identify obstacles and aids to problem-solving -Name and explain 4 types of motivation -Describe Maslow's Hierarchy of Needs & Apply it to Clinical settings -Identify how emotions are expressed -Describe physiological differences between emotions -Calculate intelligence (IQ) using the formula of mental age/chronological x 100 -Provide the meaning of personality -Discuss in detail the 3 theories of personality development (Piaget, Freud & Erikson)	LGIS SGD Role Play	SEQ/MCQ/OPSE VIVA

	-Neurobiological Basis of Behavior	-Highlight and examine the neurobiological basis of emotions, language, memory and arousal	LGIS	SEQ/MCQ/OPSE VIVA
Sociology and Anthropology of health	-Sociology & Health	-List rationale for studying sociology & anthropology of health -Describe the impact of family units, structure and functioning on health -Explain primary and secondary social groups and their effect on health -Examine role of social class, gender & child-rearing practices on health -Explain Roles, social support, stigma, religion, sick role and death and dying as they relate to health -Discuss social factors affecting treatment adherence	LGIS	SEQ/MCQ/OPSE VIVA
	-Anthropology & Health	-Explain culture, beliefs, values and norms, folkways, mores, laws with examples -Explore influence of culture on healthcare and treatment adherence -Describe the LEARN model of cultural sensitivity	LGIS Role Play	SEQ/MCQ/OPSE VIVA
Psychosocial Aspects of Health and Disease	-Psychosocial Aspects of Health and Disease	-Define and elaborate upon the components of health and normality -Define & explain the characteristics of defense mechanisms	LGIS Role Play	SEQ/MCQ/OPSE VIVA
	-Psychosocial Assessment	-Identify circumstances in which psychosocial assessment is recommended or necessary -List sections of a psychosocial assessment -Demonstrate the conducting of a psychosocial assessment and mental state examination	LGIS Role Play	SEQ/MCQ/OPSE VIVA
	-Psychosocial Issues in Dentistry	-Identify signs of and causes of dental phobia and dental anxieties -Describe and demonstrate psychological techniques for anxiety reduction	LGIS Role Play	SEQ/MCQ/OPSE VIVA

		-Highlight links between anxiety disorders, oral health, temporo-mandibular and facial pain and stress reduction		

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ASSESMENT

Exam Component	Marks
Internal Assesment	**20**
Summative Assessment **Theory** **a. SEQs: 05 (**09 marks each) **b. MCQs. 45 (**01 mark each) **Total**	 45 45 **90**
OSPE & VIVA	**30**

LEARNING RESOURCES

- Handbook of Behavioral Sciences for Medical and Dental Students (3rd Edition) by Mowadat H. Rana
- BRS Behavioral Science (7th Edition) by Barbara Fadem
- Kaplan and Sadock's Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry (11th Edition) by Benjamin J. Sadock, Virginia A. Sadock, Pedro Ruiz
- Shorter Oxford Textbook of Psychiatry (7th Edition) by Paul Harrison, Philip Cowen, Tom Burns
- Atkinson and Hilgard's Introduction to Psychology (16th Edition) by Nolen Et Al, Susan Nolen-Hoeksema

RAHBAR COLLEGE
OF DENTISTRY

Department of Operative Dentistry

Study Guide

2026

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WELCOME NOTE

Welcome to the exciting journey in Pre-Clinical Operative dentistry! Our department is dedicated to providing you with the knowledge, hands-on experience, and mentorship needed to excel. Take full advantage of our state-of-the-art facilities, expert faculty, and clinical opportunities. Here, you will find essential resources, key concepts, and practical insights that will enhance your knowledge in the subject of Preclinical Operative Dentistry. We aim to provide you with clear, structured content that complements your classroom learning and prepares you for both exams and future clinical practice. We are here to support you in every step of this journey.

Prof. Muhammad Nasir Saleem
Head, Department of operative Dentistry

RATIONALE FOR THE COURSE

In Pakistan, dental issues like caries, periodontal disease, and endodontic infections are widespread, largely due to poor oral hygiene, sugary diets, and limited access to care, especially in rural areas. Dental caries is the most common, leading to a high demand for restorative treatments. Root canal infections often result from untreated cavities, while non-carious cervical lesions are increasing due to improper brushing and stress. Cosmetic dentistry is gaining popularity in urban areas. However, public awareness about preventive care remains low, and access to quality treatment is limited, underscoring the need for better education and healthcare resources.

Operative dentistry is a crucial part of dental education, providing students with the skills to diagnose, prevent, and treat common dental issues like caries, trauma, and endodontic infections. The scope includes restorative procedures like fillings, crowns, veneers, and root canal treatments, along with preventive care to maintain oral health. This field also covers aesthetic dentistry, focusing on improving the appearance of teeth. Overall, Operative dentistry equips students with essential skills to provide comprehensive functional and aesthetic dental care.

Non-clinical subjects are crucial to operative dentistry, providing the foundational knowledge necessary for effective treatment. **Dental anatomy and histology** help in understanding tooth structures, essential for cavity preparation and restorations. **Biochemistry** and **microbiology** inform caries management and infection control, while **pathology** aids in diagnosing diseases affecting oral tissues. **Pharmacology** is vital for using anesthetics and antibiotics during procedures, **dental materials** knowledge ensures the correct use of restorative materials while **behavioral sciences** improve patient communication and care. Together, these subjects enhance clinical skills in operative dentistry.

Information transfer methods will include classroom teaching, hands-on exercises, video demonstrations, small group discussions, case-based learning, and role plays. Educational approaches encompass interactive lectures, collaborative learning, self-study, and tutorials. Cognitive objectives focus on engaging discussions and demonstrations, while psychomotor objectives emphasize clinical skills and patient handling, enhancing affective learning through peer interactions.

Support options for students in Operative Dentistry include well-equipped **clinic**, **simulation labs**, and **research facilities** to enhance hands-on learning and innovation. **Faculty support** through mentorship, dedicated office hours for tutoring, and interdisciplinary collaboration fosters personalized learning. **Clinical experience opportunities**, such as hands-on training and community service, provide practical exposure. **Peer support networks**, including study groups and organizations, promote teamwork, while **academic resources** like libraries and workshops enrich learning. **Continuous feedback** and **wellness services** ensure students' progress and well-being throughout their education.

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DEPARTMENTAL DETAILS

Head of department	Prof. Dr. Muhammad Nasir Saleem
Study Guide developed by	Prof. Dr. Muhammad Nasir Saleem Dr. Hira Anjum
Total Lectures	36
Practical Demonstrations	20

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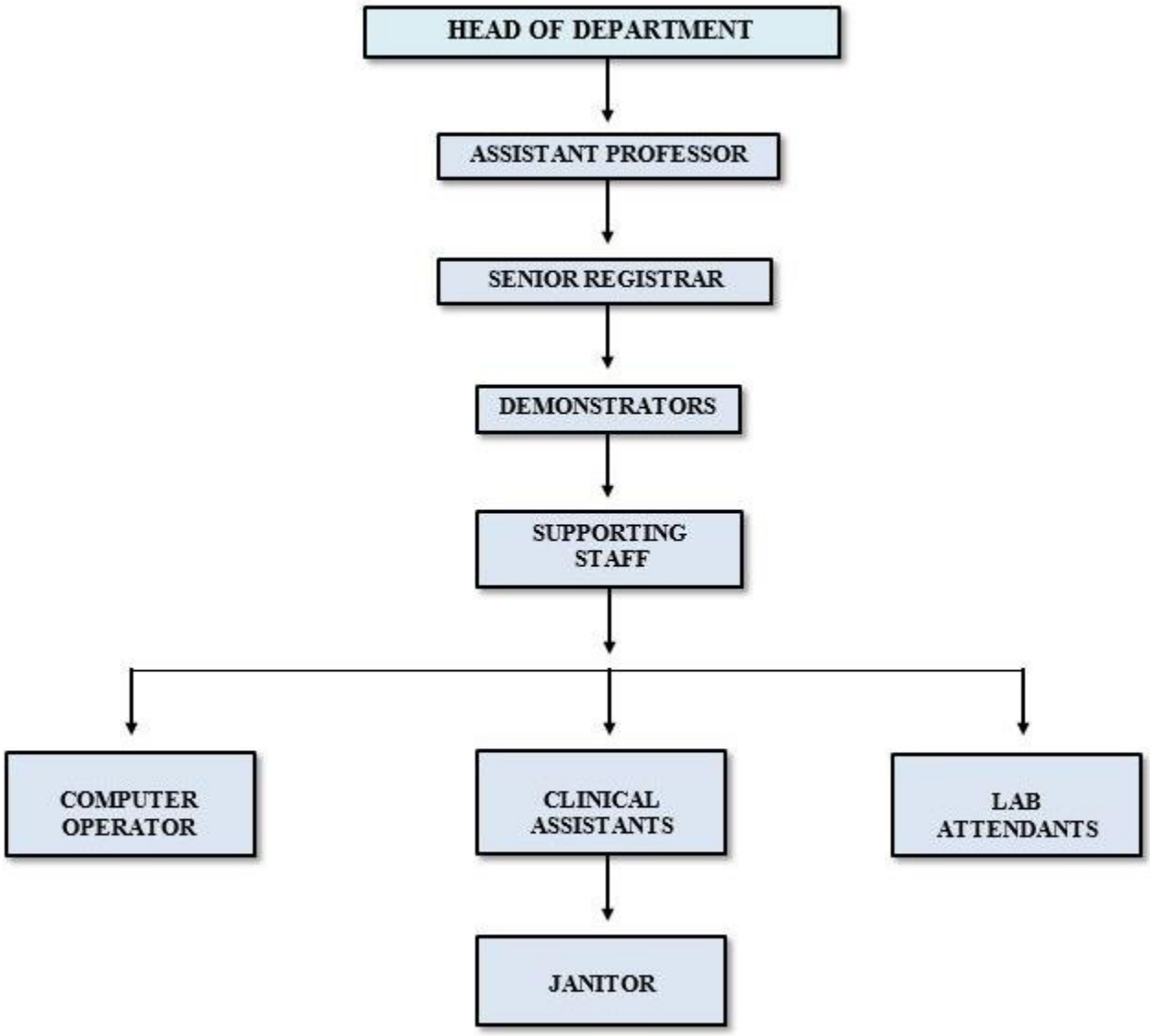
DEPARTMENTAL ORGANOGRAM



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COURSE INSTRUCTORS

Sr no.	Name	Designation
1.	Prof. Dr. Muhammad Nasir Saleem	Professor
2.	Dr. Hira Anjum	Assistant Professor
3.	Dr. Hira Imtiaz	Senior Registrar

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PRE-CLINICAL ROTATION PLAN

Sr. No.	LIST OF PRACTICALS
1.	Dental Instruments: Introduction, holding techniques and uses
2.	Rubber Dam Application (Anterior teeth)
3.	Rubber Dam Application (Posterior teeth)
4.	Pits and Fissure Sealants
5.	Class I cavity Preparation (Premolars)
6.	Liners and Bases
7.	Class I Amalgam Restoration (Premolars)
8.	Class I Cavity Preparation (Molars)
9.	Class I Amalgam Restoration (Molars)
10.	Class II Cavity Preparation
11.	Class II Amalgam Restoration
12.	Application of matrix band and retainer systems
13.	Cavity Preparation for Tooth Colored Restoration (Class III)
14.	Tooth Colored Restoration (Class III)
15.	Cavity Preparation for Tooth Colored Restoration (Class IV)
16.	Tooth Colored Restoration (Class IV)
17.	Cavity Preparation for Tooth Colored Restoration (Class V)
18.	Tooth Colored Restoration (Class V)
19.	Cavity Preparation for Tooth Colored Restoration (Class VI)
20.	Tooth Colored Restoration (Class VI)

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COURSE LEARNING OBJECTIVES

TOPIC	MIT	LEARNING OUTCOMES	MODE OF ASSESSMENT
Introduction to Operative Dentistry	LGIS	**KNOWLEDGE** Describe the basic principles, philosophy & techniques of Operative Dentistry.	Viva, MCQs
Instruments and Equipment for tooth preparation.	LGIS / Demonstration	**KNOWLEDGE** Recognize different instruments used in tooth preparation. Describe their functions. Differentiate between hand and rotary instruments.	Viva
		SKILL Identify the instruments and equipment for tooth preparation. Perform the use of different instruments on manikin teeth.	OSPE
Infection control	LGIS/ Demonstration	**KNOWLEDGE** Identify different methods of contamination. Discuss cross infection protocol. State the recommended CDC guidelines for infection control.	SEQs, MCQs viva
		SKILL Demonstrate application of personal barrier and aseptic techniques. Demonstrate cross infection protocol. Implement sterilization procedures and handle amalgam waste disposal.	OSPE
Rubber Dam Isolation, Rubber Dam Application Anterior & posterior teeth	LGIS / Demonstration/ practical	**KNOWLEDGE** Emphasize the importance of isolation. Identify components of rubber dam Outline stepwise procedure for application of rubber dam.	Viva

		SKILL Know the basic armamentarium for rubber dam application**.** Apply rubber dam on typodonts.	OSPE
Dental Caries	LGIS/ practical	**KNOWLEDGE** Learn the etiology of dental caries. Classify dental caries. Recognize the radiographic appearance of dental caries.	Viva, MCQs, SEQs
		SKILL Identify clinical characteristics of dental caries.	OSPE
Preliminary considerations in Operative Dentistry-chair position	Demonstrati on	**SKILL** Perform patient and operator position and instrument exchange.	OSPE
Fundamentals of tooth Preparations	LGIS/ Practical	**KNOWLEDGE** Identify the essential principles of cavity preparation, including outline form, resistance form, retention form, and convenience form. Discuss the role of these principles in ensuring the longevity and effectiveness of restorative treatments.	Viva, MCQs, SEQs
		SKILL Perform cavity preparations using appropriate hand instruments and rotary instruments while adhering to the principles of cavity design.	OSPE
Class I cavity preparation for amalgam	LGIS / Practical	**KNOWLEDGE** Outline the principles and steps of class I amalgam cavity design.	Viva, MCQs, SEQs
		SKILL Demonstrate the ability to perform accurate Class I cavity preparations using hand instruments and rotary tools, while	OSPE

		maintaining the principles of cavity design.	
Lining and Pulpal Protection materials	LGIS	**KNOWLEDGE** Exhibit understanding the special physiologic and structural characteristics of the pulp dentin complex and how they affect the pulpal response to injury. Explain the advantages, limitations, and appropriate uses of various lining and pulpal protection materials Identify the clinical use and considerations of different materials	Viva, MCQs, SEQs
		SKILL Follow established protocols for the application of lining and pulpal protection materials.	OSPE
Class I cavity Lining in all upper and lower molars and premolars	Practical	**SKILL** Perform mixing of lining material Place lining material in prepared cavity.	OSPE
Amalgam Restoration in class I	LGIS / Practical	**KNOWLEDGE** Learn the principles and technique of amalgam restoration.	MCQs, SEQs, Viva
		SKILL Manipulate amalgam, including trituration, condensation, carving, and polishing, to achieve optimal anatomical form and function.	OSPE
Class II Cavity Preparation	LGIS / Practical	**KNOWLEDGE** Outline the principles and steps of class Il amalgam cavity design.	Viva, MCQs, SEQs

		SKILL Demonstrate the ability to perform accurate Class Il cavity preparations using hand instruments and rotary tools, while maintaining the principles of cavity design.	OSPE
Matrix band and retainer systems	LGIS / Practical	**KNOWLEDGE** Identify different types of matrix band systems (e.g., Tofflemire, sectional matrices) and their respective components, including matrix bands, retainers, and wedges. Enlist the indications for using various matrix systems in different types of restorations, such as class II amalgam or composite restorations.	MCQs, SEQs
		SKILL Assemble and place a matrix band and retainer system on a tooth in preparation for a class II restoration Insert wedges to seal the gingival margin and stabilize the matrix band, ensuring a smooth and accurate restoration	OSPE
Class II Amalgam filling with matrix band	LGIS / Practical	**KNOWLEDGE** Learn the principles and technique of amalgam restoration.	MCQs, SEQs, Viva
		SKILL Apply Matrix band for class II Cavity and Restoration Manipulate amalgam, including trituration, condensation, carving, and polishing, to achieve optimal anatomical form and function.	OSPE

Introduction to Composites Light curing of restorative materials	LGIS / Practical	**KNOWLEDGE** Classify composites. Comprehend polymerization properties and general considerations for composite restorations. Develop understanding of clinical technique.	Viva, MCQs, SEQs
		SKILL Handle composite material efficiently. Apply curing light for polymerization.	OSPE
Class I and Class II Composite restorations Amalgam Vs Composite	LGIS	**KNOWLEDGE** Review of differences in both the materials.	Viva, MCQs,SEQs
Class III, IV and V Cavity Design, Clinical Technique for Direct Composite Resin	LGIS / Practical	**KNOWLEDGE** Outline the steps of class III, IV and V composite restorations.	Viva, MCQs, SEQs
		SKILL Perform the steps of class III, IV and V composite restorations, clinical techniques	OSPE

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LEARNING RESOURCES

Sr. No.	Title of Book	Edition
1.	Sturdevant's Art and Science of Operative Dentistry	2nd South Asian Edition
2.	Endodontics: Principles and Practice by Torabinjad. Richard E Walton, MahmoudTorabinjad.	6th edition
3.	Summitt's Fundamentals of Operative Dentistry- A Contemporary Approach	4th Edition
4.	Contemporary fixed prosthodontics by Stephan R. Rosentiel	5th Edition
5.	Paediatric Dentistry by Richard R. Welbury	5th Edition

RAHBAR COLLEGE
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Department of Prosthodontics

Study Guide

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RCoD LAHORE

WELCOME NOTE

It is with great pleasure to welcome our young and energetic students to the Department of Prosthodontics, Rahbar College of Dentistry, Lahore. Prosthodontics is the field of dentistry which deals with the replacement of lost oral structures including teeth and surrounding tissues through fixed and removable means.

Prosthodontics faculty aims to initiate the learning in early years and continue with the learning process in subsequent years with an integrated approach. We Department of Prosthodontics strongly believes in continuation of research and development activities for the students and faculty members. It is well equipped with the latest innovative materials and techniques, including digital dentistry, thus improving the teaching facilities as well as optimizing the quality of service to its patients.

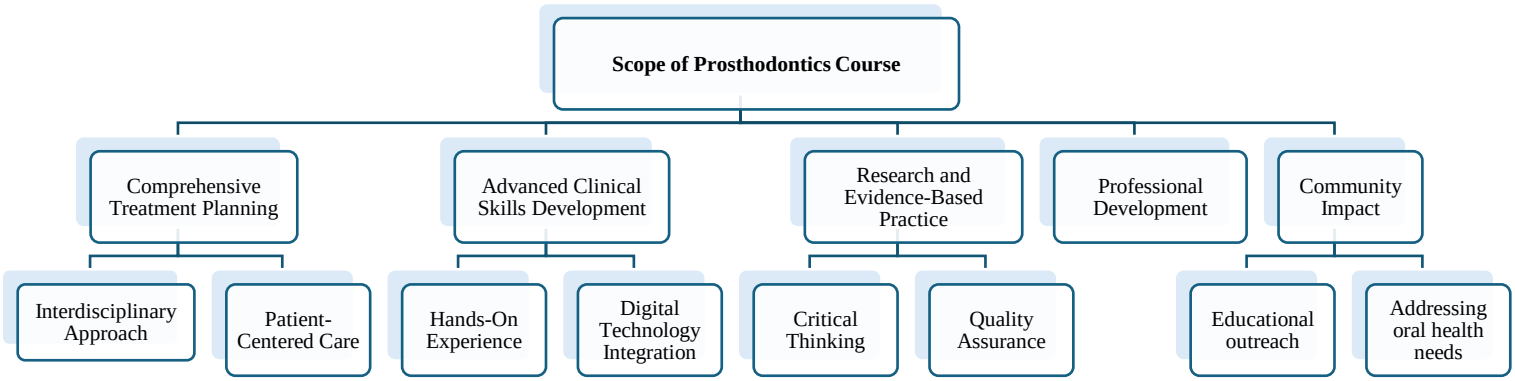
With effective planning, critical thinking and collective teamwork, I believe to promote the institutional working at par with the global standards.

Prof. Dr. Hina Zafar Raja
Head, Department of Prosthodontics

RATIONALE OF COURSE

The clinical department of prosthodontics in Pakistan must navigate a complex landscape of dental problems that necessitate tailored approaches to treatment and patient education. Here's a focused overview:

Course Significance and Scope:



The correlation between non-clinical and clinical aspects of prosthodontics is essential for effective practice. Knowledge of **oral and maxillofacial anatomy** aids in the precise placement of prosthetics and implants, while an understanding of head and neck **anatomy** informs surgical planning. Additionally, familiarity with **oral physiology**, including TMJ function, guides material selection and restoration design to ensure proper occlusion. Insights into the biochemical properties of **dental materials** are crucial for anticipating tissue reactions, while awareness of the oral **microbiology** helps manage infections and enhance prosthetic longevity. Recognizing oral diseases and their systemic implications is vital for treatment planning, and knowledge of material properties drives the choice of durable materials and innovative technologies.

Adopting student-centred teaching methods in prosthodontics enhances engagement, critical thinking, and practical skills. **Problem-Based Learning (PBL)** promotes collaboration by having students solve real-world clinical scenarios, while **Flipped Classroom** methods encourage active participation through hands-on activities after independent study. **Simulation-Based Learning** allows students to practice procedures safely, boosting confidence and competence. **Peer Learning** fosters communication as students teach each other, and **Case-Based Learning** enhances critical thinking through real patient cases. **Competency-Based Education** focuses on skill mastery tailored to individual needs. **Service-Learning** integrates community needs with practical experience, enriching students' understanding of oral health.

A supportive educational environment in prosthodontics is crucial for student success. Access to **well-equipped laboratories and simulation suites** allows students to practice prosthetic techniques in a controlled setting. **Digital dentistry** tools, like **intraoral scanners**, familiarize students with current practices, while learning management systems streamline communication and resource sharing. Dedicated faculty mentors offer personalized guidance, enhancing students' educational experience. **Structured clinical rotations** and community service programs provide hands-on training in real-world settings. **Peer support** networks, including **study groups and student organizations, foster collaboration.** Academic resources like libraries and workshops enrich learning, while continuous **feedback mechanisms** and **counselling services** promote both academic growth and well-being.

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DEPARTMENTAL DETAILS

Head of the department	Prof. Dr. Hina Zafar Raja
Course Instructors	Prof. Dr. Hina Zafar Raja Dr. Junaid Altaf Dr. Fizza Tahir
Total Lectures	36
Practical Demonstrations	1 for every 36 weeks for Batch A and B

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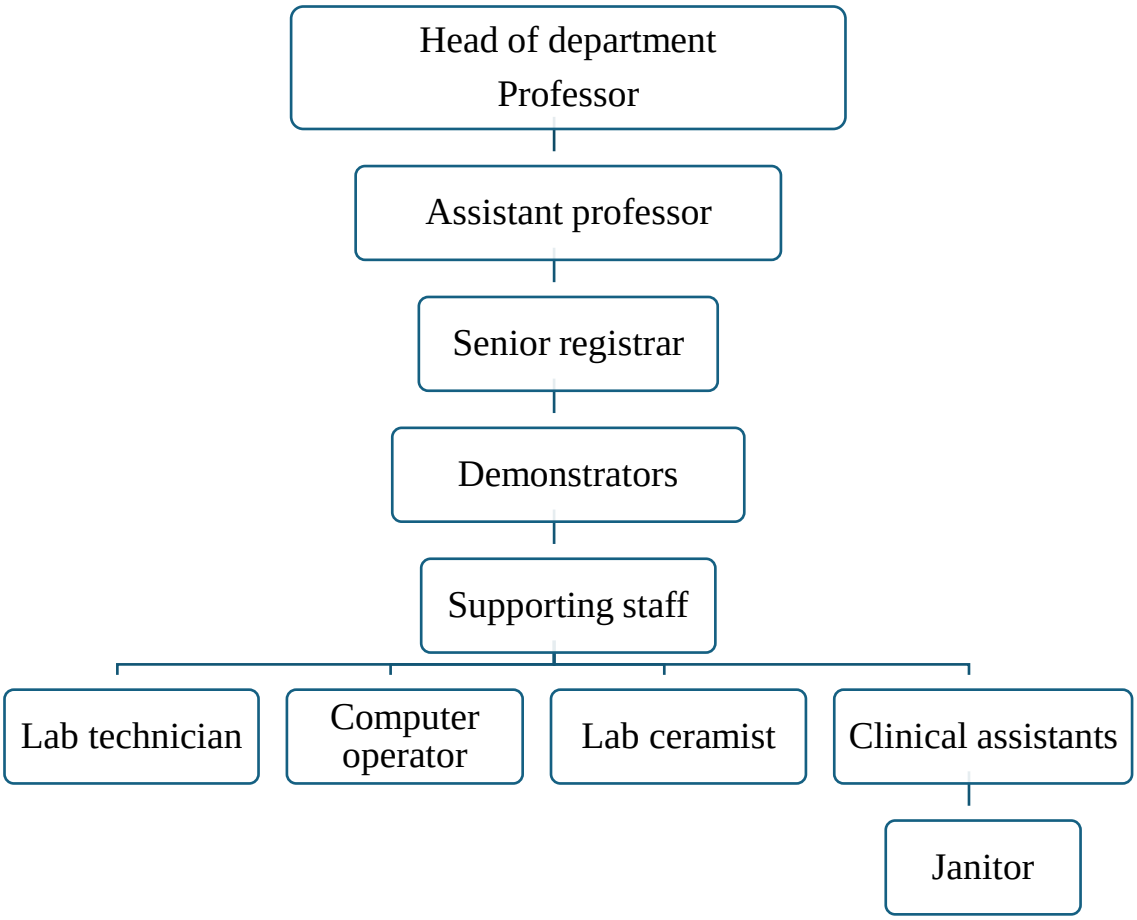
DEPARTMENTAL ORGANOGRAM



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COURSE INSTRUCTORS

Sr. No.	Name	Designation
1	Prof Dr. Hina Zafar Raja	Professor/ HOD
2	Dr. Junaid Altaf	Assistant Professor
3	Dr. Fizza Tahir	Senior Registrar

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LIST OF PRACTICALS

Sr no.	Topic
1.	Identification Of Landmarks on Casts
2.	Removal Of Teeth and Finishing of Cast
3.	Duplication of cast
4.	Surveying of cast
5.	Wax Pattern designing and fabrication
6.	Clasp pattern Fabrication
7.	Investing of cast partial denture framework
8.	Casting and finishing of cast partial denture framework
9.	Occlusal Rims Fabrication
10.	Types of Articulators
11.	Parts of Articulator
12.	Facebow
13.	Articulation of base plate with occlusal rims
14.	Selection of anterior and posterior teeth
15.	Arrangement of anterior and posterior teeth
16.	Acrylic Mixing, Packing, curing in cast partial denture
17.	Finishing and polishing of cast partial denture
18.	Occlusion and occlusal adjustments in cast partial denture

COURSE LEARNING OBJECTIVES

Topic	Course Content	Learning Outcome At the end of each module, student will be able to:	MIT	Assessment Tool
Introduction to Removable and Fixed Prosthodontics	Difference between RPD and FPD Components of RPD Components of FPD	**KNOWLEDGE** -Describe the differences between RPD and FPD -Describe the differences between acrylic RPD and Cast RPD -Describe different components of RPD and their role in RPD -Describe different components of FPD and their role in FPD **SKILLS** -Identify different components of RPD and FPD	LGIS Small group discussion Clinical demonstration	MCQ/ SAQ OSCE
Impression material used in RPD & FPD	Alginate impression Additional Silicone Impression	**KNOWLEDGE:** -Describe the clinical applications of alginate impression in removeable and fixed prosthodontics -Elaborate the manipulation of Alginate impression (proportioning, mixing, tray loading) -Describe step by step procedure of recording alginate impression -Brief handling impressions to avoid distortion or damage before sending them to the dental laboratory -Describe the clinical applications of Additional Silicone Impression in removeable and fixed prosthodontics	LGIS Small group discussion	MCQ/SAQ

		SKILLS: -Select an appropriate impression material for fixed and removable prosthodontic impression -Record impression using alginate impression material -Evaluate the impression for shortcomings and correct them. -Handle the impression before pouring with gypsum for cast fabrication **ATTITUDE:** -Document patient records -Strictly follow cross infection control protocol -Respect and maintain patient confidentiality. -Cultivate a professional demeanour when interacting with patients -Refer the patient to specialist where indicated.	Clinical demonstration Clinical demonstration	OSCE OSCE
Cast or die fabrication & investment of wax up / **Gypsum products used in RPD and FPD**	-Type 2 Dental stone (Soft Plaster) -Type 3 Dental stone (Hard plaster) -Type 5 Dental stone (Investment plaster)	**KNOWLEDGE**: -Enlist the clinical applications of different types of dental stone. -Describe the manipulation technique of soft plaster, hard plaster die stone and investment plaster -Describe the step-by-step procedure of fabrication of cast	LGIS Small group discussion	MCQ/SAQ

		-Describe the guidelines how to trim the cast -Brief the step-by-step procedure of fabrication of die -Enlist the clinical application of various investment materials in fixed and removeable prosthodontics. -Elaborate the procedure of investing and devesting RPD framework -Describe the procedure of investing and devesting crown wax up **SKILLS:** -Manipulate (Proportionate, mix) hard plaster and pour alginate impression (Hard plaster) -Use type 2 dental stone (soft plaster) and add base on already poured cast -Retrieve the cast and evaluate to be free of distortion or bubbles. -Fine details are clearly visible and true to the original impression. -Trim the cast so that no excessive or unnecessary material is left. -Remove teeth from cast and smoothly finish the saddle area -Identify Kennedy class -Invest RPD framework using investment plaster	Clinical demonstration	OSCE

		-Trim the cast into horseshoe shape for FPD -Fabricate die accurately using dowel pin method -Invest crown wax up using investment plaster **ATTITUDE:** -Document patient records -Strictly follow cross infection control protocol -Cultivate a professional demeanour	Clinical demonstration	OSCE
Surveying the cast and Designing of RPD	Surveyor types Surveying Path of insertion of denture Designing of RPD	**KNOWLEDGE**: -Define surveying -Differentiate between various types of surveyors -Describe the objectives of surveying -Describe factors that determine the path of insertion of denture -Elaborate step by step procedure of surveying of diagnostic cast -Describe tripoding and its types **SKILLS:** -Identify the type of surveyor -Perform surveying of diagnostic cast (identify the height of contour of each of each surface of tooth, identify retentive undercuts, identify interfering undercuts, determine the path of insertion and removal	LGIS Small group discussion Clinical demonstration	MCQ/SAQ OSCE

		ATTITUDE: -Cultivate a professional demeanour -Follow cross infection control protocol	Clinical demonstration	OSCE
Designing of RPD	Difference in prosthesis support Tooth supported RPD Tooth and tissue supported RPD Essentials of RPD design	**KNOWLEDGE:** -Describe the difference in prosthesis support and influence on design -Differentiate between two main types of removable partial denture. -Describe the systematic approach of designing RPD -Describe differential support concept in tooth and tissue supported RPD -Describe various components of RPD and their best use to limit the prosthesis movement **SKILLS:** -Identify the roles of different components of RPD in prosthesis movements. -Demonstrate differential support for distal extension base RPDs -Design the RPD by selecting and appropriately positioning the components on desired areas of abutment or tissues to achieve the best possible prosthetic outcome	LGIS Small group discussion Clinical demonstration	MCQs/SAQs OSCE

		ATTITUDE: -Cultivate a professional demeanour -Follow cross infection control protocol	Clinical demonstration	OSCE
Wax up for Removable partial denture	Beading wax, Boxing wax Pattern wax Sticky wax Baseplate wax	**KNOWLEDGE**: -Enlist clinical applications for different waxes use in fixed or removable prosthodontics -Describe the step-by-step procedure of beading and boxing of secondary impression -Describe the step-by-step procedure of wax up for framework of Cast partial denture **SKILLS:** -Identify different types of waxes used in removable prosthodontics -Perform beading and boxing of wax using beading and baseplate wax -Perform wax up of design of cast partial denture using pattern waxes and inlay wax -Apply sticky wax to secure jaw relation record -Apply sticky wax to secure fracture denture parts during repair **ATTITUDE:** -Cultivate a professional demeanour	LGIS Small group discussion Clinical demonstration Clinical demonstration	MCQ/SAQ OSCE OSCE

		-Follow cross infection control protocol -Depict learning attitude		
Wax up for Fixed partial denture (crown and bridge)	Material used Wax up for all metal crown Step back technique	**KNOWLEDGE**: -Enlist clinical applications of waxes use in fixed prosthodontics -Describe the step-by-step procedure of wax up of all metal crown -Describe the step back technique for wax up of Porcelain fused to metal crown **SKILLS:** -Identify different types of waxes used in fixed prosthodontics -Perform wax up of all metal crown (marginal adaptation, occlusal anatomy, contact points establishment, finishing of pattern). -Perform wax up of coping of PFM crown using inlay wax (marginal adaptation, occlusal anatomy, contact points establishment, finishing of pattern) **ATTITUDE:** -Cultivate a professional demeanour -Follow cross infection control protocol -Depict learning attitude	LGIS Small group discussion Clinical demonstration Clinical Demonstration	MCQs/SAQs OSCE OSCE
Casting of metal for removable and fixed prothesis	Cast Gold Nickel Chromium	**KNOWLEDGE:** -Describe the clinical application of cast	LGIS	MCQ/SAQ

	Cobalt Chromium	gold, nickel chromium and cobalt chromium in fixed and removable prosthodontics. Describe the steps of investing wax pattern of cast partial denture, crown or bridge. Describe the steps involved in casting for Crown, bridge or Cast partial denture. **SKILLS:** -Select an appropriate investment material for each alloy -Invest wax pattern of crown, bridge and cast partial denture. -Select an appropriate material for casting of crown, bridge and cast partial denture. -Perform casting procedure for all metal crown using Nickel Chromium -Complete casting of partial denture framework using Cobalt Chromium **ATTITUDE:** -Cultivate a professional demeanour -Follow cross infection control protocol -Depict learning attitude	Small group discussion Clinical demonstration Clinical Demonstration	OSCE OSCE
Denture Base addition to metal framework	Heat cure Acrylic Denture base	**KNOWLEDGE:** -Define denture base	LGIS Small group discussion	MCQ/SAQ

	Auto polymerizing acrylic denture base Photo polymerizing acrylic denture base Metal base Attachment of denture base with metal framework	-Enlist different materials that can be used as denture base -Describe the method for attachment of different denture base material with metal framework **SKILLS:** -Select an appropriate material for denture base of cast partial denture -Attach different denture base materials with metal framework of Cast partial denture -Perform finishing and polishing of denture base **ATTITUDE:** -Cultivate a professional demeanour -Follow cross infection control protocol -Depict learning attitude	Clinical demonstration Clinical demonstration	OSCE OSCE
Addition of occlusal rims, Bite Registration for RPD and Articulation of casts	Waxes Zinc oxide eugenol Impression plaster Bite registration Silicone Articulators Articulation procedure Articulation verification	**KNOWLEDGE:** Enlist different materials that can be used for bite registration Enlist the advantages and limitations of each bite registration material Describe step by step procedure of bite registration Classify different types of articulators and brief the steps of articulation of casts **SKILLS** -Select an appropriate material for bite registration for fixed	LGIS Small group discussion Clinical demonstration	MCQ/SAQ OSCE

		and removable partial denture. -Perform bite registration of partially dentate patient using different bite registration material -Handle and store bite/ interocclusal record before sending to lab -Select an appropriate articulator for RPD and FPD -Articulate maxillary and mandibular casts using bite registration record **ATTITUDE:** -Cultivate a professional demeanour -Follow cross infection control protocol -Depict learning attitude	Clinical demonstration	OSCE
Teeth setup for RPD	Acrylic teeth Porcelain teeth Composite Resin Methods of attaching artificial teeth	**KNOWLEDGE:** -Enlist Differences of natural and artificial teeth. -Classify different types of artificial teeth based on material and shape -Describe the clinical application of various types of artificial teeth -Describe the method for attachment of acrylic teeth with acrylic denture base -Explain the method for attachment of porcelain or composite resin teeth with acrylic denture base -Describe different methods for attachment of acrylic, porcelain or composite resin teeth	LGIS Small group discussion	MCQ/SAQ

		with metal denture base **SKILLS**. -Differentiate between different types of artificial teeth based on material and shape -Select an appropriate material and shape of artificial teeth for any removable partial denture case. -Perform teeth setup for removable partial denture case. -Attach acrylic teeth to heat cure acrylic denture base -Attach porcelain or composite resin teeth to acrylic denture base -Attach acrylic, porcelain or composite resin teeth to metal denture base **ATTITUDE:** -Cultivate a professional demeanour -Follow cross infection control protocol -Depict learning attitude	Clinical demonstration Clinical demonstration	OSCE OSCE
Ceramic work for PFM crown	Opaque Porcelain Body Porcelain Enamel Porcelain Baking of porcelain Glazing	**KNOWLEDGE:** -Describe different types of ceramics available -Describe the clinical application of metal ceramic restoration. -Describe the clinical application of different types of all ceramic restorations	LGIS Small group discussion	MCQ/SAQ

		(Feldspathic, lithium di silicate and zirconia) -Describe step by step procedure of porcelain addition on metal coping for porcelain fused to metal crown -Describe step by step procedure of baking of porcelain -Differentiate between glazing and polishing of porcelain **SKILLS:** -Identify different types of ceramics available. -Perform opaque, body and enamel porcelain application on metal coping of porcelain fused to metal crown -Perform baking of porcelain -Perform glazing and polishing of porcelain **ATTITUDE:** -Cultivate a professional demeanour -Follow cross infection control protocol -Depict learning attitude	Clinical demonstration Clinical demonstration	OSCE OSCE

LEARNING RESOURCES

Recommended Books

1. McCracken's
Removable Partial Prosthodontics
Alan B. Carr, David T. Brown
12th edition

2. Contemporary Fixed Prosthodontics
Rosenstiel. Land. Fujimoto

Reference Books

1. Stewart's Clinical
Removable Partial Prosthodontics
Rodney D. Phoenix, David R. Canga, Charles F. DeFreest.
4th Edition

ASSESSMENT POLICY AND PLAN

RAHBAR COLLEGE
OF DENTISTRY

PRINCIPAL

PROF. DR. MUHAMMAD NASIR SALEEM

RAHBAR COLLEGE OF DENTISTRY

No.102/RCoD/ Dated: July 2024

To: Director Admin

Info: Medical Branch

Assessment Policy and Plan

Aim: To provide a comprehensive and fair assessment system that accurately reflects student learning, development, and preparedness for professional practice in dentistry.

Objectives:

- Ensure assessments are aligned with learning objectives and curricular outcomes.
- Utilize a variety of assessment methods to evaluate different competencies.
- Maintain high standards of fairness, consistency, and transparency in assessments.

1. Responsibility

All faculty and staff involved in administering and supervising examinations and assessments are responsible for:

- Ensuring adherence to assessment procedures.
- Conducting examinations and assessments under conditions that are consistent and fair to all students.

2. Principles

- Assessments in the BDS program at RCoD will be aligned with student learning objectives and course activities, including both formative and summative assessments.
- These assessments will follow the examination regulations of the University of Health Sciences (UHS).
- The university shall appoint an external examiner for the concerned exam.
- The institute will manage in-house assessments, while professional examinations will be conducted by UHS.
- Marks allocation to internal and external examiner shall be as per the university instructions of the concerned subject.
- Standardized procedures will be applied across all courses.

3. Scope

This policy applies to all undergraduate students registered in the BDS program at RCoD.

4. Assessment policy

- Each student must appear in the yearly professional exam of all subjects specific for that particular, to qualify for the successive year.
- There is continuous assessment throughout each year through (end of term) block exam, send-ups and professional Exam.
- Assessment procedures are as follows;

Types of Assessment Procedures (Table 1)

I. Formative Assessments:

- Formative assessments, conducted regularly throughout the term, provides feedback to students with the aim of enhancing their learning and improving their performance in summative evaluations.
- It is carried out informally and as required during and after lectures (e.g., 1-minute feedback, problem-based questions, quizzes), tutorials (e.g., question and answer sessions), case-based discussions, written assignments, and class presentations.
- Log books contain rubrics for continuous self-assessment of the practical /clinical sessions, as well as formative assessments.
- Portfolio development is also promoted and assessed as part of the formative evaluation process.
- Reflection is a mandatory part of all laboratories, pre-clinical and clinical exposures
- Regular feedback sessions are held after each term examination (block exam) to aid in improving student performance.

ii. Summative Assessments:

- Conducted as end term exam (Block Exam) carrying 4% weightage to be included in a total of 10% within internal assessment. Each exam shall consist of theory and practical examination.
  The division of weightage shall be as follows.
  - Written exam consists of MCQs & SEQs, carrying 50% weightage.
  - Practical exam consists of OSPE/OSCE and structured viva, carrying 50% weightage.
- Marks of each exam (End term) are included in internal assessment.
- Research carries 1% weightage in internal assessment.
- Send up carries 1% weightage in internal assessment.

- Attendance carries 2% weightage in internal assessment, with equal contribution of (1%) each, of lecture & practical/clinical sessions.
    - Minimum required attendance = 85% = 2% weightage int assessment.
- Generic competencies carry 2% weightage in internal assessment. (Table 2)
- The passing percentage for each exam is 50%.
- Candidates failing to gain passing scores in annual and supplementary exam, shall be detained in the existing year.

iii. Islamic Studies/Civics and Pakistan Studies

- Islamic Studies/Civics and Pakistan Studies will be assessed in first professional examination.
- The paper will carry 100 marks in total. Islamic Studies contains 60 marks and Pakistan Studies carries 40 marks.
- In Islamic studies part, there will be three LEQ to be attempted out of five LEQs, carrying 20 marks each.
- In Pakistan studies part, there will be two LEQ to be attempted out of four LEQs, carrying 20 marks each.

Note: Islamic studies is for Muslims and civics is for non-Muslims.

	End Term/ Block - 1	**End Term/ Block - II**	**End Term/ Block - III**	**Send up examination**
Subject 1				
Subject 2				
Subject 3				
Subject 4				

iv. Research Assessment Plan: (Table 1)

- A research coordinator of each year shall submit a report in each block about the progress of each student of the given research project.
- Completion of each step in respective year shall score for each respective year.
- Research coordinator of each year shall submit the report to Director, Research & Development cell & Department of dental education.
- Department of dental education shall communicate the report to each internal examiner for inclusion in respective internal assessment of each year.

(Table 1: Research Assessment Plan)

Sr. No.	Status	Code	Year of completion	Score
1	Group formation, Topic Selection, Synopsis writing	Code 1	1ST Year	(0.33, 0.33, 0.33) = 1
2	Proposal submission & approval by ERC & TRC with certificates.	Code 2	2nd year	(0.33, 0.33, 0.33) = 1
3	Data Collection & Analysis	Code 3	3rd year	(0.50, 0.50) = 1
4	Manuscript writing, Reviewing and Editing	Code 4	Fourth year	(0.50, 0.50) = 1
5	Article submission & Publication	Code 5	House job	(0.50, 0.50) = 1

v. Assessment of Generic Competencies. (Table 2)

Total weightage in internal assessment = 2%

(Table 2: Assessment of Generic Competencies*)

Competencies	**Weightage in competencies assessment (2%)**	**Components**	**Score**
Professionalism	3	Communication skill	0.50
		Time management	0.50
		Ethics & integrity	0.50
		Teamwork	0.50
		Problem solving skills	0.50
		Empathy in patient care	0.50
Critical thinker	2	Analysis	1
		Inference	1
Creativity	1	Innovation	1
Leadership	1	Vision & Strategy	0.5
		Decision making	0.5
Emotional intelligence	1	Self-regulation	1
Life-long learner	2	Curiosity	1
		Self-directed learning	1

- Marks obtained to be divided with 10 to get score (Y) out of 100
- In case the total marks of exam are different from 100 use the following formula
- (Y/100)x Total marks

(Table 3: Key for assessment of generic competencies)

Criteria	Unsatisfactory	Needs Improvement	Satisfactory	Exemplary
Communication Skills	Incoherent, unclear, or inappropriate communication	Communication is often unclear or lacks clarity	Communicates effectively and professionally	Communicates with exceptional clarity, persuasiveness, and adaptability
Time Management	Frequently misses deadlines, fails to prioritize tasks	Occasionally misses deadlines, struggles with prioritization	Meets deadlines consistently, manages time effectively	Excels at time management, consistently exceeds expectations
Ethics and Integrity	Demonstrates unethical behavior, lacks integrity	Occasionally exhibits questionable behavior, may compromise integrity	Adheres to ethical standards, maintains integrity	Exemplifies ethical behavior and integrity in all interactions
Teamwork	Reluctant to collaborate, works independently	Contributes to the team but may have difficulty working with others	Works effectively as part of a team, contributes positively	Leads and inspires the team, fosters a collaborative environment
Problem-Solving	Avoids challenges, unable to find solutions	Struggles to solve problems independently, needs guidance	Solves problems effectively with occasional guidance	Consistently identifies and solves complex problems creatively and efficiently
Patient Care	Neglects patient needs, provides substandard care	Provides adequate patient care but may lack empathy or compassion	Delivers high-quality patient care, demonstrates empathy	Excels at patient care, consistently goes above and beyond
Critical thinker: Analysis	Unable to identify key components or relationships	Identifies some components but struggles to analyze relationships	Analyzes information effectively, identifies key components and relationships	Excels at analysis, breaks down complex information into its constituent parts and evaluates their significance
Critical thinker: Inference	Makes unfounded or illogical conclusions	Draws some inferences but may lack supporting evidence	Draws logical inferences based on evidence	Excels at inference, draws insightful and well-supported conclusions
Creativity/Innovation	Lacks innovative ideas, relies on conventional approaches	Shows some innovation but may struggle to generate truly novel ideas	Demonstrates innovation, presents new and original approaches	Excels at innovation, generates groundbreaking and transformative ideas
Leadership: Vision and Strategy	Lacks clear vision and strategic direction	Has a basic vision but may struggle to articulate it	Develops a clear vision and strategic plan	Excels at vision and strategy, inspires and motivates others with a compelling vision
Leadership; Decision-Making	Makes poor decisions, lacks judgment	Makes reasonable decisions but may need guidance	Makes sound decisions, demonstrates good judgment	Excels at decision-making, consistently makes effective and strategic choices

Emotional intelligence; Self-Regulation	Unable to manage emotions effectively, reacts impulsively	Manages emotions but may struggle with stress or conflict	Effectively manages emotions, controls impulses	Excels at self-regulation, consistently demonstrates emotional maturity and resilience
Life-long learner: Curiosity	Lacks curiosity, shows little interest in learning	Shows some curiosity but may not be motivated to explore new things	Demonstrates curiosity, is eager to learn and explore new ideas	Excels at curiosity, is highly curious and motivated to seek out new knowledge and experiences
Life-long learners: Self-Directed Learning	Relies heavily on external guidance, struggles to learn independently	Takes some initiative in learning but may need guidance	Effectively learns independently, sets goals and takes responsibility for own learning	Excels at self-directed learning, is highly motivated and self-disciplined, able to learn effectively on their own

vi. Complete Assessment Criteria (Table 4)

Types of Assessment		Weightage	Frequency and Time	Methods/ Tools for Assessment
Formative		-	Informally during and after the session.	Class tests (MCQs, SEQs), Class presentations, Assignments,Tutorials, Case Based Discussions, Problem Based Learning, Portfolios
Summative	Internal Assessment	10 %	Block exam (4%) Research (1%) Send up score. (1%) Attendance (2%) Lecture Clinical/ Lab Generic competencies (2%)	MCQs (one best answer), SEQs, OSPE (non-clinical years), OSCE (clinical years), Simulated patients and Phantom head lab procedures, Viva Voce, Logbook and clinical quotas. Assessment of generic competencies through rubrics
	University Exam	90 %	Once at the end of academic year	MCQs (one best answer), SEQs, OSPE (non-clinical years), OSCE (clinical years), Logbooks and Clinical cases quotas,Viva Voce

vii. Assessment Format:

Each end of term (block exam) written and practical/clinical exam assessment format will be as follows:

Written assessment:

End of term (Block) assessment format:

MCQs	20 MCQs(20mins)	20 marks
SEQs	10 SEQs of 3 marks each	30 marks
Total marks	50	

Send-up and Prof Assessment format:

Major Theory Exam: 3 hours

MCQs	45 MCQs (45 mins)	45 marks
SEQs	15 SEQs of 3 marks each (2 hour 15min)	45 marks
Total marks	90 marks	

Minor Theory Exam: 2 hour 30 min

MCQs	21 MCQs (30 mins)	21 marks
SEQs	8 SEQs of 3 marks each (2 hour)	24 marks
Total marks	45 marks	

a. MCQs format

- MCQs in all exams will be single best type.
- There will be five options in each MCQ.
- There will be no negative marking.
- MCQs will be of C2 and C3 level.

b. SEQ format

- SEQs will be based on major content areas of the respective subject.
- Each SEQ carries 3 marks.

c. Oral/Practical/Clinical Exam format in Send up.

Major Subjects

Oral and practical Examination shall have 90 marks

Minor Subjects

Oral and Practical Examination shall have 45 marks

Practical/Clinical assessment will be done with OSPE/OSCE stations with the weightage as mentioned above.

d. Marks Distribution:

- **Major Subjects**
- Total marks of each major subject = 200
- Written assessment marks = 90
- Oral/Practical marks = 90
- Internal Assessment marks = 20
- **Minor Subjects**
- Total Marks of each minor subject=100
- Written assessment marks= 45
- Oral/Practical marks= 45
- Internal Assessment marks=10

5. Assessment Planning

A: Planning Process

- **Coordinator Responsibility:** Session coordinators will develop consensus among subject heads for block tests and (send-up) at the session's start, with final approval by the Principal of RCoD, to be included in the Academic calendar.
- **No Overlap:** Ensure that no overlap of class tests occurs between different subjects.
- **Learning Objectives:** Each course will outline learning objectives and give details on how students' achievement of objectives will be assessed.
- **Syllabus Assessment Plan:** Each department will develop a plan according to the Table of Specification, including methods, timing, and contributions to the final mark of all assessments.
- **Table of Specification:** Each department will follow the ToS created by the university UHS.
- **Discussion with Specialists:** Discuss assessment planning documents with Subject Specialists to ensure appropriate curricular representation.

6. Examination Development and Administration

a. Development Process

- **Question Pool:** Course directors, with teaching faculty, will develop a departmental assessment question pool.
- **Revisions:** Course directors will revise question items before submitting in a password protected flash drive to department of dental education. The questions will be checked and transferred to a computer with no internet connectivity.
- **Finalization:** Department of dental education shall approve the formatting of reviewed questions, two weeks prior to the assessment date.
- **Question paper printing & Answer sheets:** Course directors will collect the printed papers with answer sheets in sealed envelopes from department of dental education on the day of examination.
- **Conduct of exam:** The seals of papers shall be opened in the examination halls in the presence of candidates and two invigilators. The whole activity shall be monitored.
- **Post-Item Analysis:** Post-item analysis of MCQs will be done using OMR, based on the analysis, the MCQs will be modified or eliminated from future exams. Also, re-scoring if a significant number of items are problematic.
- **Results Notification**: Results will be notified to the students within two weeks of the examination.
- **Post-Examination Feedback**: Test discussions and feedback after each assessment will be provided.

7. Eligibility Criteria.

A: Attendance

- Minimum 85% attendance of all educational activities i.e. lectures, SGDs/tutorials, practical/clinicals, official symposia, co-curricular/extra-curricular activities including sports day and community visits.
- Leave is considered an absence unless supported by valid documentation.

B: Supplementary Students

- Supplementary students must attend classes of the new academic session for better subject orientation.
- Lecture attendance will be 80%, counted immediately after the supplementary theory exam.

C: Detained Students

- Must pass all end of term (block exams) and send-up tests and attend planned lectures.
- Detained hostel students' lecture policies may vary with the Principal's permission.

8. Assessment

- Pass mark is 50% of total test scores for each subject.
- Send-ups must be passed.
- Academic evaluations will ensure consistent assessment and feedback processes.

9. Individual Assessment Criteria

- Faculty will review individual assessments regularly to determine student progression.
- The academic coordinator will offer remediation for underperforming students.
- Remediation should occur in the summer break after summative assessments.
- Parent-teacher meetings will be held for underperforming students at designated times.

10. Feedback

Faculty will provide feedback after each block and at conclusion of an academic year.

- Formative feedback during each preclinical course/module.
- Mandatory feedback for major exams (like end of term) block exams.

- Clinical test feedback at the end of each rotation.

Students should review assessments by contacting the course director.

11. Appeal Mechanism for Results

- Students can apply for rechecking of results (block exam) within two working days of result declaration
- The application will be submitted to the Department of Dental Education and will be approved by the principal RCoD.
- Applications received after that will not be entertained.
- The answer sheet will only be shown to the student.
- Response after the appeal of the result rechecking will be declared within one week.
- The rechecking of professional exam will be according to UHS policy.

12. Quality Control

- Collaborating closely with the Student Affairs and Quality Assurance Committee can facilitate the resolution of any issues, contributing to successful outcomes.
- Data from assessments will be leveraged to improve the effectiveness of academic staff, the performance of students, the quality of courses, and the institution's overall operations.
- The Department of Dental Education will carry out frequent evaluations of academic activities and ensure the implementation of this policy by keeping comprehensive records of assessment data.