Reviewed on 21-02-2026

MODULE- 04
PRE-CLINICAL DENTISTRY II
(Neoplasia & Dental Rehabilitation)

2nd Year BDS

KMU (IHPER) - Dental Central Curriculum Committee
Pre-Clinical I

Themes

Table 1: Themes

S.NO	Theme	Duration in Weeks/hours
1.	Lumps, Bumps & its triggers	2.5 weeks (84 hrs)
2.	Repair/Rehabilitate	1.5 weeks (56 hrs)
3.	A patient with Chest Pain & Shortness of Breath requiring extraction	1 weeks (24 hrs)
	Total hours	5 weeks (164 hrs)

Teaching Hours Allocation

Table 2: Hours allocation for different subjects

S. No	Subject	Hours
1.	General Pathology	70
2.	Pharmacology	19
3.	Chemistry of Dental Materials	44
4.	Community & Preventive Dentistry	13
5.	Oral Pathology	4
6.	Physiology	2
7.	Oral Medicine	2
8.	Oral & Maxillofacial Surgery	1
9.	Periodontology	4
10.	Pre-Clinical Prosthodontics	5
	Total	**164**

***7 Hours per day for 5 days (Monday to Friday) = 35 hours/ week**

Learning Objectives

By the end of this module the students of 2nd year BDS will be able to;

1. Define neoplasia and oncology, Classify the tumors with respect to their tissue of origin and nature
2. Discuss the common tumor terminology for benign epithelial tumors and enlist the basic components of tumors
3. Define differentiation and anaplasia, compare invasion and metastasis and discuss the main pathways of spread of a cancer.
4. Define various benign oral epithelial tumors, Compare the characteristics of benign and malignant tumors
5. Relate the genetic alteration to pathogenesis of neoplastic disorders
6. Relate the role of carcinogenic agents to neoplastic disorders
7. Describe the sequence of events leading to hemostasis, roles of the platelets, coagulation factors, endothelium in hemostasis, and compare hyperemia and congestion.
8. Discuss the pathophysiology of edema and shock and differentiate between inflammatory and non-inflammatory edema, exudate, and transudate.
9. Describe diagnosis and prognosis of squamous cell carcinoma, basal cell carcinoma and malignant melanoma
10. Define, enlist and briefly describe precancerous lesions & conditions
11. Define grading of tumors and its significance, define staging of tumors, discuss basis of TNM system
12. Discuss and classify anti-cancer drugs and describe the pharmacology of anti-tumor drugs
13. Discuss Primary Healthcare
14. Explain healthcare delivery systems.
15. Discuss planning and evaluation
16. Explain the steps and roles of oral health surveys
17. Explain the principles of oral health nutrition and diet counselling
18. Discuss the role of dental auxiliaries in dentistry
19. Discuss classifications, pharmacological actions, MOAs, uses and adverse effects of CVS Drugs
20. Discuss, chelating agents and Anti-dirhearial agents' types, applications, MOA, adverse effects
21. Discuss Immunosuppressant drugs and endocrine drugs; types, applications, MOA, adverse effects
22. Discuss and classify anti-cancer drugs and describe the pharmacology of anti-tumor drugs
23. Discuss classifications, pharmacological actions, MOAs, uses and adverse effects of CVS Drugs
24. Discuss, chelating agents and Anti-dirhearial agents' types, applications, MOA, adverse effects

25. Discuss Immunosuppressant drugs and endocrine drugs; types, applications, MOA, adverse effects
26. Define and discuss various terms like narcosis, analgesics and opiates, Classify and identify various opioids agonist.
27. Discuss and classify drug used for treatment of amebiasis and Anthelminitics
28. Explain health education and health promotion, discuss methods of public awareness and shifts in health promotion strategies
29. Discuss epidemiology of oral cancers and Prevention of Oral cancers .
30. Define Occupational Hazards, discuss Occupational hazards, discuss relationship between dentistry and associated health hazards
31. Explore metals and alloy systems to improve performance, biocompatibility and esthetic properties of various indirect restorations.
32. Explore ceramic compositions, processing techniques, and technologies to improve durability, esthetics, and biocompatibility.
33. Define Base metal alloys, Describe the composition, manipulation, properties, biocompatibility of alloys.
34. Describe the composition and Properties of steel and stainless steel, describe the method for fabrication of stainless-steel denture bases and discuss their importance.
35. Discuss Dental wires with special reference to its Requirements and available materials.
36. Describe morphology, transmission, clinical findings, and diagnosis of Entamoeba histolytica, Free-Living Amoebae, Taenia & Echinococcus, Ascaris, Ankylostoma & Enterobius

TABLE OF SPECIFICATIONS

THEME 1: Lumps, Bumps & its triggers		
Topic	Hr	Learning Outcome
General Pathology		
1. Intro to neoplasia with nomenclature	2	1.1 Define neoplasia and oncology 1.2 Classify the tumors with respect to their tissue of origin and nature/ behavior 1.3 Discuss the common tumor terminology for benign epithelial tumors 1.4 Enlist the basic components of tumors 1.5 Differentiate choristoma and hemartoma from the tumors
2. Characteristics of Benign and malignant tumors	3	2.1 Define differentiation and anaplasia 2.2 Compare invasion and metastasis 2.3 Discuss the main pathways of spread of a cancer 2.4 Compare the characteristics of benign and malignant tumors
3. Effects of tumors on host	2	3.1 Define cancer cachexia 3.2 Explain the cancer cachexia with malnutrition 3.3 Discuss the effects of tumors on the host. 3.4 Define the paraneoplastic syndromes 3.5 Define the paraneoplastic syndromes with examples and its underlying tumors.
4. Predisposing Conditions	1	4.1Discuss the interaction between environmental factors, age, acquired predisposing conditions and genetic factors in cancer development 4.2 Discuss dietary intake as predisposing condition to oral cancer development.
5. The Genome	3	5.1 Discuss the role of protein coding and Non-coding DNA 5.2 Discuss the role of epigenetics changes in diseases 5.3 Describe the role of Micro-RNA and Non-coding RNA in diseases 5.4 Discuss the gene editing
6. Genetic Diseases	2	6.1 Define the terms hereditary, familial and congenital diseases 6.2 Discuss the various genetic changes that can affect the structure and function of proteins contributing to diseases.
7. Cancer Genes: Genetic lesions in cancers	3	7.1 Define cancer genes 7.2 Enlist the four major functional classes of cancer genes 7.3 Give the inherited predisposition to cancers 7.4 Define driver and passenger mutation

		7.5 Define the terms point mutation, gene rearrangement, deletion, gene amplification, aneuploidy, microRNAs
8. Carcinogenesis: A multistep process	4	8.1 Enumerate the hall marks of carcinogenesis 8.2 Discuss the control of cell cycle 8.3 Define proto-oncogenes and discuss its significance 8.4 Give the therapeutic targeting of hall marks of cancers
9. Carcinogenesis: Tumors suppressor genes	1	9.1 Discuss the role of RB genes in regulation of cell cycle 9.2 Describe the role of Tp53 in maintaining the integrity of the genome
10. Chemical carcinogens and radiation carcinogens	1	10.1 Classify the chemical carcinogens 10.2 Enlist common chemical carcinogens with their corresponding cancers 10.3 Discuss the oncogenic properties of the radiations
11. Viral and microbial carcinogens	2	11.1 Enlist the oncogenic viruses and bacteria with their corresponding cancers
12. Laboratory diagnosis of cancers	2	12.1 Enumerate the various lab. Modalities (including morphologic, biochemical and molecular) available for tumor diagnosis 12.2 Define tumor markers 12.3 Discuss the significance of tumor markers 12.4 Explain the importance of molecular profiling of tumors.
13. Grading and staging of cancers	1	13.1 Define grading of tumors and its significance 13.2 Define staging of tumors 13.3 Give basis of TNM system 13.4 Give significance of staging of cancer
Oral Pathology		
14. Benign Epithelial Tumors	1	14.1 Define Squamous cell papilloma, condyloma acuminatum & melanocytic naevi 14.2 Describe their etiology and risk factors 14.3 Explain their clinical features 14.4 Describe their histopathological features
15. Precancerous Lesions & Conditions	3	15.1 Describe the Architectural and Cellular features of Epithelial Dysplasia and its various grades. 15.2 Define, enlist and briefly describe precancerous lesions & conditions • Oral submucous fibrosis • Oral lichen planus • Actinic keratosis • Discoid Lupus Erythematosus (DLE) • Sideropenic Dysphagia (Plummer-Vinson Syndrome) 15.3 Describe role of vitamin A and iron in precancerous lesions and condition.
Oral Medicine		

16. Malignant Transformation of Oral potentially malignant disorders OPMD & Clinical features of suspicious malignant lesions	1	16.1 Discuss transformation of OPMDs into malignancy. 16.2 Discuss clinical features of malignant lesions.
17. Oral Cancer	1	17.1 Define Oral Carcinoma 17.2 Discuss etiology of oral carcinomas 17.3 Discuss TNM staging for oral cancers
Periodontology		
18. Gingival enlargement	2	18.1 Enlist classification of gingival enlargement 18.2 Describe inflammatory/idiopathic/drug induced gi ngival enlargement 18.3 Discuss the Enlargement associated with systemic diseases/conditions/false enlargement 18.4 Management of gingival enlargement (Non-surgical and surgical)
Oral and Maxillofacial Surgery		
19. Identification of suspicious lesions	1	19.1 Evaluate suspicious oral lesions, including ulcers, masses, and discolorations. 19.2 Enlist the type of biopsies of suspicious lesions to obtain tissue samples for histological examination. 19.3 Enlist various imaging techniques to assess the extent of tumor growth and involvement of surrounding structures
Community Dentistry		
20. Occupational Hazards	1	20.1 Define Occupational Hazards 20.2 Discuss Occupational hazards 20.3 Discuss relationship between dentistry and associated health hazards 20.4 Discuss Recommendations
21. Epidemiology of oral cancers	2	21.1 Discuss the burden of oral cancers in a global scenario. 21.2 Discuss the etiological risk factors of oral cancers 21.3 Describe the steps of smoking cessation using 5A's. 21.4 Discuss the role of dentist in prevention of oral cancers. 21.5 Discuss the protective dietary factors in the prevention of oral cancer.
Dental Materials		
22. Overview of Dental waxes	1	22.1 Understand the fundamental principles and applications of dental waxes in dentistry.
23. Overview of Investment Materials	1	23.1 Compare various investment materials. 23.2 Understand the fundamental principles and applications of investment materials in dentistry.
24. Introduction to Gold and Noble Metal Alloys	2	24.1 Describe properties of gold. 24.2 Differentiate between carat and fineness.

		24.3 Describe pure gold fillings with respect to properties, and advantages in clinical dentistry.
25. Traditional Casting Gold Alloys	2	25.1 Classify dental casting gold alloys according to ISO 1562:1995. 25.2 Explain typical composition of casting gold alloys 25.3 Differentiate various dental casting gold alloys with respect to properties.
26. Hardening Heat Treatments	3	26.1 Describe different types of hardening heat treatments of alloys. 26.2 Describe the effects of hardening heat treatments of the microstructure and properties of silver-copper system and gold-copper system. 26.3 Discuss the clinical importance of heat treatments. 26.4 Describe low gold-content alloys and silver-palladium alloys
27. Soldering and Brazing	2	27.1 Define soldering and brazing. 27.2 Enlist steps of soldering technique 27.3 Explain factors affecting the result of soldering 27.4 Describe the clinical significance soldering and brazing.
Junior Prosthodontics		
28. Premolars Teeth Setup:	1hr	28.1 Explain positioning of maxillary and mandibular premolars as seen in frontal, lateral and incisal/ occlusal view. 28.2 List the anatomical and functional guidelines for arranging maxillary and mandibular premolars in complete dentures. 28.3 Define key terms such as buccal corridor, cusp angulation, central fossa position, and compensating curve. 28.4 Explain the correct positioning of premolars when viewed from the frontal, lateral, and incisal/occlusal perspectives, including the desired angulation and buccolingual position. 28.5Describe the role of premolars in esthetics, occlusion, mastication, and denture stability.
General Pathology & Microbiology (Parasitology)		
29. Entamoeba histolytica & dispar	1	29.1 Describe morphology, transmission, clinical findings, and lab diagnosis of Entamoeba histolytica (amoebiasis) & Dispar.
30. Entamoeba gingivalis	1	30.1 Describe morphology, transmission, clinical findings, and lab diagnosis of Entamoeba gingivalis
31. Porphyromonas gingivalis	1	31.1 Describe morphology, transmission, clinical findings, and lab diagnosis of Porphyromonas gingivalis

32. Giardia spp	1	32.1 Describe morphology, life cycle, transmission, clinical findings, and lab diagnosis of Giardia spp
33. Taenia spp	1	33.1 Describe morphology, transmission, clinical findings, and diagnosis of Taenia saginata and Taenia solium
34. Echinococcus spp	1	34.1 Describe morphology, transmission, clinical findings, and diagnosis of Hydatid cysts
35. Introduction to Nematodes	1	35.1 Discuss the general characteristics of nematodes
36. Ascaris	1	36.1 Describe morphology, transmission, complications, and diagnosis of Ascaris infections.
37. Ankylostoma	1	37.1 Describe morphology, life cycle, and lab diagnosis of Ankylostoma (hookworm)
38. Enterobius	1	38.1 Describe morphology, life cycle, and lab diagnosis of Enterobius (pinworm).
39. Trematodes/ Schistosoma	1	39.1 Describe morphology, transmission, complications, and diagnosis of Schistosoma
Pharmacology		
40. Drug treatment of amebiasis	2	40.1 Classify anti amebic drugs on chemical and therapeutic basis 40.2 Describe the MOA, antimicrobial spectrum, clinical uses, ADRs, drug interactions of: • Metronidazole • Diloxanide furoate • Ipodoquinol • Emetine • Dehydroemetine • Chloroquine
41. Anthelminitics	1	41.1 Classify anthelmintics on the basis of type of parasite 41.2 Describe the MOA, anthelmintic spectrum, clinical uses, ADRs, drug interactions of: • Praziquantel • Niclosamide • Benzimidazoles • Albendazole • Mebendazole
42. Anti diarrheal drugs	1	42.1 Describe the Classifications, uses, MOA and adverse effects of antidiarrheal drugs
43. Chelating agents	1	43.1 Describe the Classifications, MOA, adverse effects and application of common chelating agents like dimercaprol, DMSA, EDTA, unithiol, penicillamine, deferoxamine, deferasirox
Lab Work		
Pharmacology		
44. Prescription writing	1	44.1 Construct prescriptions for tapeworm infestation and ascariasis.
General Pathology		

45. Ascaris	2	45.1 Identify the egg of the parasite
46. Ankylostoma	2	46.1 Identify the egg of the parasite
47. Tenia	2	47.1 Identify the egg of the parasite
48. Hydatid cyst	2	48.1 Identify the specimen
49. Enterobius	2	49.1 Identify the egg of the parasite
50. Squamous cell carcinoma	2	50.1 Identify the slide of squamous cell carcinoma under light microscope
51. Basal Cell carcinoma	2	51.1 Identify the slide of basal cell carcinoma under light microscope
52. Pleomorphic adenoma	2	52.1 Identify the slide of pleomorphic adenoma under light microscope
THEME 2: REPAIR / REHABILITATE		
Dental Materials		
53. Base Metal Alloys – Cobalt Chromium	2	53.1 Describe Cobalt-chromium alloys with respect to • Composition • Manipulation • Properties • Biocompatibility • Applications
54. Base Metal Alloys – Nickle Chromium	2	54.1 Describe Nickle-chromium alloys with respect to • Composition • Manipulation • Properties • Biocompatibility • Applications
55. Comparison of Base Metal and Casting Gold Alloys	2	55.1 Compare base metal alloys with casting gold alloys with respect to • Physical Properties • Mechanical Properties • Biocompatibility
56. Casting	3	56.1 Define casting and investment mold 56.2 Describe various components of a typical investment mold. 56.3 Explain the importance of investment mold for Casting procedure. 56.4 Discuss Casting machines.

		56.5 Explain the Faults produced during casting procedure.
57. Wrought Alloys – Steel & Stainless Steel	2	57.1 Define wrought alloys and give examples. 57.2 Define steel and stainless steel. 57.3 Describe the composition and properties of steel and stainless steel.
58. Applications of Stainless Steel	2	58.1 Describe the method for fabrication of stainless-steel denture bases and discuss their importance. 58.2 Discuss dental wires with special reference to its requirements and available materials.
59. Dental Porcelain – Composition, manufacturing, Properties and Types	3	59.1 Differentiate between ceramics and porcelain 59.2 Describe compositions of Dental Porcelain 59.3 Enlist various types of dental porcelains according to fusion temperature 59.4 Explain Manufacturing and Properties Porcelain with special reference to its composition.
60. All ceramic Restorations	3	60.1 Explain methods for strengthening ceramics 60.2 Explain all ceramic restorations with reference to materials used
61. CAD-CAM Restorations & Porcelain Veneers	2	61.1 Describe CAD-CAM restorations in dentistry. 61.2 Illustrate Porcelain Veneers
62. Porcelain Fused to Metal	2	62.1 Explain the requirements of alloys with respect to Porcelain fused to metal (PFM) restorations 62.2 Discuss the alloys that are currently available for porcelain bonding 62.3 Comprehend the fundamental principles of tooth preparation for PFM restorations including biomechanical considerations and esthetic requirements 62.4 Describe Capillary technology with respect to PFM restorations
J. Prosthodontics		
63. Molar Teeth Setup	1hr	63.1 Explain positioning of maxillary and mandibular, molars as seen in frontal, lateral and incisal/ occlusal view 63.2 List the functional and anatomical guidelines for arranging maxillary and mandibular molars in complete dentures. 63.3 Define key terms such as central fossa position, compensating curve, curve of Wilson, and buccolingual inclination. 63.4 Explain the correct positioning of molars as seen from the frontal, lateral, and incisal/occlusal views, including cusp alignment, fossa

		relationships, and occlusal plane orientation. 63.5 Describe the role of molars in mastication, occlusal balance, denture stability, and load distribution.
64. Guidelines and compensating curves	1hr	64.1 Explain the Basic Guidelines for Tooth Setup. 64.2 Define Compensating Curves 64.3 List the basic guidelines for arranging teeth in complete dentures, including esthetics, phonetics, occlusion, and anatomical considerations. 64.4 Define the term Compensating Curves and related concepts (Curve of Spee, Curve of Wilson). 64.5 Explain the purpose of following standardized tooth setup guidelines in achieving esthetics, stability, and functional occlusion. 64.6 Describe how compensating curves contribute to balanced occlusion during functional movements (protrusive and lateral excursions).
65. Rehabilitation of function	2hrs	65.1 List the Laboratory Steps After Tooth Setup and Wax-Up. 65.2 Identify the basic trimming and finishing steps. 65.3 Describe the steps involved in polishing of final denture.
G.Pathology		
66. Overview of healing and repair	1	66.1 Define tissue repair 66.2 Enlist its two main reactions 66.3 Define the healing in terms of regeneration, fibrosis, resolution and organization. 66.4 Enlist the steps of scar formation.
67. Gram Negative rods related to respiratory tract (Haemophilus, Bordetella and Legionella)	3	67.1 Discuss the diseases, important properties, pathogenesis, Clinical findings, laboratory diagnosis and prevention Gram Negative rods related to respiratory tract
Community Dentistry		
68. Primary Health Care	2	68.1 Define Primary Healthcare. 68.2 Discuss declaration of Alama Ata. 68.3 Enlist and explain the principles of primary healthcare. 68.4 Describe the core elements of Primary Healthcare. 68.5 Enlist the requirements of Primary Healthcare (8 A's and 3C's). 68.6 Assess the integration of dental services within primary health care systems.
69. Introduction to healthcare systems	2	69.1 Discuss the health care systems. 69.2 Define and explain the structure of the healthcare system in Pakistan, with a focus on oral health services. 69.3 Identify challenges in delivering oral health care within the public health system. 69.4 Compare Pakistan's healthcare system to other countries of oral health outcomes.

70. Planning And Evaluation	1	70.1 Define plan. 70.2 Discuss planning cycle. 70.3 Discuss rational planning model 70.4 Define evaluation and discuss its types and steps.
71. Oral health survey	1	71.1 Define surveying and its role in dentistry. 71.2 Describe the steps of survey. 71.3 Describe pathfinder survey.
72. Oral Health and nutrition	1	72.1 Discuss the effect of nutritional deficiencies on oral health. 72.2 Describe the steps in dietary counselling. 72.3 Enlist WHO dietary goals.
73. Dental Auxiliaries	1	73.1 Define dental auxiliaries. 73.2 Classify dental auxiliaries. 73.3 List the role of dental auxiliaries. 73.4 Explain about their importance in community dental health.
Pharmacology		
74. Anticancer Drugs	2	74.1 Discuss and classify anti-cancer drugs. 74.2 Discuss & identify indications and adverse effects of alkylating agents. 74.3 Describe the pharmacology of anti-tumor drugs. 74.4 Summarize the regimens in the treatment of individual cancers 74.5 Describe the drug used in chemotherapy induced nausea and vomiting and other antitussive drugs
75. Anti-emetic drugs	1	75.1 Describe the Classification, pharmacological actions, MOA and adverse effects of Anti-emitics
Lab Work		
Community Dentistry		
76. Dietary counseling in a dental care setting	2	76.1 Assess patient's dietary habits and identify potential oral health risks by using FFQ and 24hrs dietary recall. 76.2 Provide personalized dietary advice to patient's specific needs and oral health status. 76.3 Apply oral health education principles to provide comprehensive dietary counseling. 76.4 Calculate and interpret Dental Health Score from patient's food diary
Periodontology		
77. Manual SRP/ Ultrasonic scaling	2	77.1 Identify the basic manual and ultrasonic scaling instruments.
Dental Materials		
78. Fabrication of Porcelain fused to Metal Prosthesis	10	78.1 Observe the steps during fabrication of Porcelain fused to Metal Prosthesis. 78.2 Recognize various materials and equipment

		used during fabrication of porcelain fused to metal prosthesis.
Theme 03: A patient with Chest Pain & Shortness of Breath requiring extraction		
General Pathology		
79. Hemostasis	1	79.1 Describe the sequence of events leading to hemostasis at a site of vascular injury 79.2 Discuss the roles of the platelets, coagulation factors, and endothelium in hemostasis
80. Hyperemia, congestion, Hemorrhage	1	80.1 Compare hyperemia and congestion 80.2 Describe the classification and pathophysiology of Hemorrhage
81. Edema	1	81.1 Define edema 81.2 Discuss the major pathophysiologic 81.3 Discuss the categories of edema 81.4 Distinguish between inflammatory and non-inflammatory edema. 81.5 Differentiate between exudate and transudate 81.6 Enlist the important clinical states associated with generalized or localized edema and the factors that underlie each condition
82. Shock	2	82.1 Describe the pathophysiology and types of shock 82.2 Describe the stages of shock 82.3 Define sepsis and septic shock 82.4 Discuss causes, pathogenesis, and laboratory findings in shock 82.5 Discuss Disseminated intravascular coagulation-DIC
83. Thrombosis	2	83.1 Describe the mechanism and pathogenetic mechanisms of vascular thrombosis 83.2 Enumerate hypercoagulable states
84. Embolism	2	84.1 Define embolism. 84.2 Enumerate the types of thromboembolism 84.3 Describe the clinical manifestations and consequences of pulmonary thromboembolism
85. Infarction	1	85.1 Define infarction 85.2 Discuss the pathogenesis and its various types.
Physiology		
86. Autonomic nervous system	2	86.1 Differentiate between the anatomical origin, neurotransmitters, and physiological functions of the sympathetic and parasympathetic divisions of the autonomic nervous system 86.2 Classify the major adrenergic (α1, α2, ß1, ß2, ß3) and cholinergic (nicotinic and muscarinic) receptors based on their location and functional response.

		86.3 Explain the mechanism of action of drugs that stimulate (agonists) or inhibit (antagonists) adrenergic and cholinergic receptors
Pharmacology		
87. CVS Drugs	5	87.1 Describe the Classification, pharmacological actions, MOA and adverse effects of • Antihypertensives • Diuretics • Antiarrhythmics • Drugs for CCF • Antianginal/MI
88. Drugs used in Bleeding disorders	3	88.1 Describe the Classification, Pharmacological actions, MOA and adverse effects of 1. Thrombolytics 2. Anticoagulants 3. Antiplatelets 4. Antihyperlipidemic
LAB WORK		
Pathology		
89. Lipid profile	2 hr	89.1 Identify lipemic serum 89.2 Learn and apply the techniques for accurately measuring serum lipid levels (Cholesterol, triglycerides HDL, and LDL)
Pharmacology		
90. Prescription writing	2	90.1 Construct Prescription for hypertension, angina/MI and CCF with dietary guidelines