CURRICULUM

ORTHODONTICS

(2025)

National University of Medical Sciences

Pakistan

1. VISION.

Our vision is to provide highest quality comprehensive basic knowledge to our undergraduate students making them able to diagnose and treat patients and generate understanding that a beautiful smile is more than just straight teeth. Building on our legacy, we rely on the latest and solid foundation to provide the highest quality and most comprehensive Orthodontic care available…

2. MISSION.

To provide the highe.st quality of orthodontic treatment to all patients, teach innovative new techniques to undergraduate students and encourage the learning capabilities of students also cultivate innovative research to improve the quality of orthodontics.

3. LEARNING STRATEGIES

a. Lectures
b. Practical.
c. Case presentations
d. Group

4. **Competencies:** The following generic competencies apply to this course:

a. Critical Thinking
b. Problem Solving
c. . Skills…
d. Professionalism
e. Procedural Skills

5. Learning Outcomes:

Specific Learning outcome of each course is attached as **Anx-A**

6. Implementation of the curriculum:

Implementation of curriculum is at the discretion of institute. Clerkships/ clinical rotations for 08 may be followed.

Clinical Training	
Clinical evaluation of patient total 5	5
Impression taking / Bite registration total 5	5
Cast analysis ● Cast in Occlusion ● Cast Apart ● Boltan Analysis ● Mixed Dentition Analysis ● Arch Length Discrepancy	Total 5 for each
Wire Bending Exercise	Total 5 for each

• Adam's Clasp • Labial Bow • Springs (finger and Z) • Canine Retractor	
Construction of Hawley's retainer	01
Cephalometric Analysis	Total 5
Case Presentation .	01

- During their clinical rotation, students in small groups learn through practical chair side demonstrations of the techniques of history taking, impression and wax bite registration, cast analysis, wire bending exercises, cephalometric tracing, and other radiographic TMJ mm. They then fabricate removable appliances on patients under supervision. They also observe and seniors in fixed appliances treatment procedures.

7. Contact Hours: 250

8. Resources:

To be filled by each Institute

Facilities:

To be filled by each Institute

9. Course u:

To be filled by each Institute

A. Examination.

1) Minimum attendance of 75% is a requirement to appear in university professional examination
2) Continuous formative evaluation is conducted during the academic year comprising of 5 theory tests, and 2 clinical assessment tests (ward tests and Pre annual). The results are communicated to students through notice board. Feedback is provided after each evaluation
3) The weighting of internal assessment is 20% in 4th professional BDS Examination
4) There will be two mid-term & term examinations followed by a pre-Annual and annual examinations each year.
5) The structure of the paper of all the term examinations and pre-annual will be the same as that for annual examination though syllabus. will be different.
6) The structure of exam will be half of the term exam.
7) The syllabus for mid-term & term examinations will be announced by the department at least 02 weeks prior to examination.
8) Pre-annual examination will be from whole syllabus.
9) The date sheet for mid-term, term and pre-annual examinations will be published by Examination branch while the examinations will be conducted by respective department. The result will be submitted to examination branch for incorporation in internal.

10) The University shall take the 4th professional Examination at the end of the academic year. Annual Theory will be of 100 marks & Practical Examination will be of 200 marks. The pass score shall be 50% in theory and practical separately. However, in clinical subjects, student should pass in clinical exams / OSCE (with 50% marks) and unobserved stations (with 50% marks) separately
11) **Log book.** Each student is expected to maintain record of practical work in log book. Safe keeping (make copies) of the log book is the responsibility of each student. The log book must be submitted to the Orthodontic department at the end of the academic year.

Communication of Information to Students: All information communicated to students through Notice boards.

Learning Resources

Recommended Textbooks

Contemporary orthodontics by Profit

Introduction to orthodontics by Laura Mitchel

Hand book of orthodontics by Robert Moyers

Introduction to Cephalometry by Jacobson

LEARNING OUTCOMES					Annex-A
TOPIC/THEME	**COURSE CONTENT**	**LEARNING OUTCOMES** At the end of each module, student will be able to:		**INSTRUCTIONAL STRATEGIES**	**%**
		Knowledge	Skills		
1. INTRODUCTION TO ORTHODONTICS					
Introduction to orthodontics	Definition, Branches of orthodontics and mm orthodontic treatment (IOTN), Terminologies, Background and Paradigm	Identify the branches of orthodontics and evaluate need and severity of orthodontic problems	Apply pertinent knowledge on patients	Lecture/ CBL	
Epidemiology	Describe the epidemiology of malocclusion including incidence and prevalence	• Describe different research design • Interpret various terms used to describe orthodontic problems		Lecture/ CBL	
2. GROWTH &DEVELOPMENT					
Growth & Development	Definition, Theories, Sites and Centers, Pre & post-natal growth of maxilla, mandible, Naso-maxillary complex, palate, TMJ growth and development. Growth assessment parameters, Cervical maturation stages, Describe changes in face form and profile, Developmental Abnormalities, mm. Psychological and social impact of abnormal growth and malocclusion	• Understand the concept of normal and abnormal pattern of growth and development of craniofacial complex • Understand the malocclusion process as a deviation from normal growth		Lecture/ CBL	
Development of dentition	Definition of primary, mixed and permanent dentition. Development of teeth and eruption. Dimensional changes in the dental arches during different dentition periods, prenatal development, variation in	Understand the concept of normal and abnormal pattern of growth and development of dentition Evaluate the deviation from		Lecture/ CBL/pbl	

	development including size, form, number and position of teeth and factors effecting development. Nolla's Stages.	normal to abnormal dental development/ malocclusion			
3. DIAGNOSTIC AIDS IN ORTHODONTICS					
Diagnosis of Malocclusion	(Obtain comprehensive history, Extra-oral and Intra-oral examination, Examination of teeth, Appraisal of soft tissue, Functional analysis, Plan the necessary investigation, maintain appropriate diagnostic record, Analyze and interpret the records, Outline the management protocol, Communicate with the patient informing the probable prognosis and financial involvement)	• Formulate a comprehensive diagnosis • Analyze the diagnostic records	Evaluate the patient clinically	Lecture/ CBL/PBL	
Diagnostic Techniques	(Obtain impression and plaster model, Technical procedure for impression and plaster model, Analysis of the study model to assess tooth-jaw discrepancy: Arch perimeter, arch length, arch width, Intra-oral radiograph, Intra-oral and facial photograph, Define cephalometry, Anthropological sources and development of cephalometrics, Objectives of cephalometric tracings. Cephalometric Landmarks- Cranial, Maxillary and Mandibular, Cephalometric Analysis- Dental, Skeletal and Skeletal-Dental Analysis,			Lectures/CBL/ PBL	

	Orthopantomogram X-Ray and importance of it in Orthodontic Treatment)				
Dental radiology	Roentgen anatomy of teeth, jaws and tmj joints, Variations within normal limits, and abnormalities, Different types of X ray mechines, Variation of X ray films (extra oral, intra oral, bite wing and occlusal), indication and use of dental radiography, Interpretation of films and Radiation hazards.	Define and recognize radiographs	Able to interpret simple radiological finding of orthodontic problems	lectures	
4. OCCLUSION					
Occlusion	Define normal and abnormal occlusion, Ideal occlusion (., definition) Andrew's six keys of occlusion, CO-CR and canine guided group function…. By.	Recognize ideal occlusion and differentiate disharmony	• Examine the occlusion • Identify and interpret malocclusion	Lecture/ CB.L	
5. . BASIS					
Bone Metabolism	Describe different tissue changes, Difference between physiologic movement and orthodontic movement, Describe Pathophysiological change of tissue, Histopathological changes at the pressure and tension area, List the types of tooth movement, explain effect of normal and excessive force, Explain the tissue changes with different types of appliances including the myo-functional appliance, Explain the biological basis of Orthodontics Therapy, Effect of drugs,	Recognize the normal bone metabolism and relate with orthodontic tooth movement	Compare normal and abnormal force levels and identify deleterious orthodontic effects	Lecture/ CBL	

	State favorable and unfavorable incidence of tooth movement, Role of bone in eruption and stabilization Deleterious effects of orthodontic tooth movement on periodontium				
6. MALOCCLUSION					
Etiology Of Malocclusion	Definition, Etiological Factors (local factors eg tooth size, number and shape) (general factors) (specific causes of malocclusion Adenoids, respiration and speech) and various terminologies.	Identify the cause of malocclusion.		Lectures/CBL/ PBL	
Malocclusion and Treatment planning	Class I (non skeletal) problem eg crowding, spacing, crossbites, openbite and deepbite), Class II (skeletal problem, div 1 and 2) and Class III (types), planning, diagnosis and management, Diagnosis, planning and treatment of simple and complex malocclusion using a range of: Removable, Functional and Fixed appliance. Describe method of treatment, Types of Orthodontic Appliances, Tooth-jaw discrepancy, Extraction and non-extraction planning, A criterion and choice of teeth for extraction, Contraindication for extraction, Extraction with Orthodontic Treatment	• Identify orthodontic problems and its features • Organize a problem list. Mm • Formulate a treatment plan		Lectures/CBL/ PBL	

7. PROTOCOLS DURING MIXED DENTITION					
Protocols used in relieving dental and skeletal problems during mixed dentition	Protocols of relieving mixed dentition crowding, Diagnosis & management of Habits, serial extractions, crossbites, space regaining, space supervision and Growth modifications, various appliances used. Explain interceptive and preventive orthodontics and methods	• Identify n	Design/ construct simple orthodontic appliances	Lectures/CBL/ .	
8. ORTHODONTIC APPLIANCES AND BIOMECHANICS					
Orthodontic Appliances….	**Removable Appliance** (Definition, Basic requirement of an Orthodontic appliance, General wire bending exercise, Design and construction of different springs and clasps, Components of removable appliance, Describe general principle of design and fabrication of removable appliance, State the type of appliance for different tooth movements, e.g. labiolingual, expansion and contraction of arches, Construction of Hawley, Begg retainer and Bite planes, Trimming and Polishing, Insertion and advice for the patients, Follow up and adjustments, Care during treatment) Selective case presentation. **Functional jaw**	Identify and differentiate different orthodontic appliances	Design and construct simple removable orthodontic appliances.	Lectures/CBL/ PBL	

	orthopedics (Describe Orthopedic force and its principles, Narrate Myo-functional appliance and describe its indication and contraindication, Technique and training for the construction of Myofunctional appliance, Clinical and laboratory steps in the construction of Class II and Class III Activator (Anderson/Mono block type) and Twin Block, Adjustment of activator after insertion in the oral cavity, Care during treatment) Selective case presentation. **Fixed Appliances** (Describe Principles, identify parts and appliance system currently used, list the advantages and disadvantages, technique and training of Fixed appliance, general wire bending exercise, use of multiple loop used in Fixed appliance, upper and lower ideal arch formation, Offset and Inset bend, 1st, 2nd and 3rd order bend, Toe in and Tip back bend, Molar band formation and welding of molar tube in the band with ideal position, Cementing of the band, Weldable bracket positioning, Direct bonding technique of mesh bracket, Adjustment of				

	arch wire and follow up, Stages of treatment progression by Fixed appliance, Anchorage (Types of anchorage, Preparation and assessment of anchorage planning, Anchorage planning according to the needs: Mild, Moderate and Maximum, Increase anchorage value- Use of head gear, Chin cup and other Extra-oral/Intra-oral anchorage) planning, Leveling, Canine retraction, Arch/Anterior contraction, both arch coordination and retention, Care during treatment) Selective case presentation.				
Material instruments and techniques used in orthodontics	Different materials, instruments and techniques used in Orthodontics, Properties of SS wire and NiTi alloy. Principle and method of wire bending exercise, Soldering- Introduction and definition, Composition and properties of Silver Solder and Fluxes, Soldering Flame, soldering method and procedure, Welding- Definition, principle and mechanism of spot welding, Heat treatment procedure.	• Identify and relate different orthodontic materials • Explain wire modification procedures	Practice different wire bending exercise	lectures	
Biomechanics	Concept, Advantages & disadvantages, limitations, Anchorage, types of movements, types of forces,	• List the biomechanical requirements of different orthodontic	Aware of clinical implementation of biomechanical requirements of orthodontic	Lectures/CBL	

	wires and Alloys used in orthodontics, ideal properties, comparison of different alloys,	appliances and their anchorage requirements • Recall the clinical implementation of biomechanical requirements of orthodontic appliances	appliances and CBLs		
9. MULTIDISCIPLINARY ORTHODONTICS					
Cleft lip & plate & orthognathic surgery	Etiological factors role of orthodontist, treatment procedures at different age groups, indication of OGS, stages of OGS, Various adjunctive and types of surgical procedures	Define and explain problems and pathophysiology	Be able to formulate problem list plan discrepancies according to age groups and PBLs.	Lectures/CBL/ PBL	
Adjunctive and Multi-disciplinary orthodontic Approaches	Adjunctive treatment goals and principles, Describe Adult Orthodontics, Appliance and technique for Adult Orthodontics, Multi-disciplinary treatment procedures. Pre-surgical Oral-Orthopedic and Orthodontic procedure and Post-surgical Orthodontic Procedure, Pre-restorative Orthodontic Procedure, Describe preventive Periodontics. TMJ Dysfunction. Selective case presentation.	Be aware of multidisciplinary approaches pertinent to orthodontic problems	Be able to predict appropriate team for orthodontic referrals and PBLs and CBLs.	Lectures/CBL/ PBL	
10. RETENTION PROTOCOLS					
Retention And Relapse	Define retention and relapse, Causes, factors, various types of retainer's role of periodontal tissues and allied causes of relapse, concept of retention and relapse, occlusal stability and management, evaluate	Choose appropriate retention regime and post treatment review of treated cases	Design simple retention appliances	lectures/CBLs /PBLs.	

	relapse after orthodontic treatment, retention after correction of different malocclusion, theorems.				

List of Clinical Demonstrations
Orthodontics
Final Year Clinical Rotation Orthodontics

Sr.#	Demonstration / Tutorial
1	Orientation to Orthodontic department and clinical area
2	History taking and Clinical examination
3	Impression taking and bite registration
4	Radiology techniques and interpretations
5	Case preparation (radiographic tracing, cast analysis, photographic evaluation)
6	Basic wire bending exercises
7	Appliance fabrication and insertion
8	Group discussion
9	Orientation with instruments and appliances

NUMS
NATIONAL UNIVERSITY
OF MEDICAL SCIENCES

CURRICULUM
FOR
PROSTHODONTICS
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1. Context / Preamble

Prosthodontics is a specialty within dentistry pertaining to the diagnosis, treatment planning, rehabilitation and maintenance of the oral function, comfort, appearance and health of patients with clinical conditions associated with missing or deficient teeth and/or maxillofacial tissues using biocompatible substitutes.

This undergraduate Prosthodontics curriculum is designed to train Bachelor of Dental Surgery (BDS) students to provide basic removable and fixed prosthodontic skills in the practice of general dentistry. This mainly involves management of partially and completely edentulous patients, fabrication of conventional removable and fixed prosthesis, implant-supported prostheses and defect prostheses as well as management of post-treatment complications.

Prosthodontics is a major subject of final professional BDS examination and carries a total of 300 marks.

2. Mission

The mission of this course is to equip dental undergraduate students with the basic knowledge, skills and attitudes for safe ethical practice of removable and fixed prosthodontics.

3. Implementation of Curriculum

Overview:

a. The Prosthodontics curriculum is divided into 11 courses or modules, taught sequentially as given below:

i. Complete Denture Prosthodontics I

1) Systemic Health Aspects and Nutritional Considerations
2) Sequelae of Wearing Complete Dentures
3) Management of Edentulous Patients

ii. Complete Denture Prosthodontics II

1) Denture's Polished Surfaces
2) Selection and Arrangement of Artificial Teeth
3) The Try-in Appointment
4) Prosthesis Insertion and Follow-up

iii. Complete Denture Prosthodontics III

1) Single Dentures
2) Lifespan of Dentures
3) Speech Considerations with Complete Dentures

iv. Removable Partial Prosthodontics I

1) Clasp Retained Partial Denture
2) Partially Edentulous Arches
3) Biomechanics of RPD
4) Connectors

v. Removable Partial Prosthodontics II

1) Rests and Rest Seats
2) Retainers
3) Denture Base Considerations

vi. Removable Partial Prosthodontics III

1) RPD Design
2) Surveying
3) Management of Partially Dentate Patient

vii. Fixed Prosthodontics I

1) History and Examination
2) Treatment Planning
3) Principles of FPD

viii. Fixed Prosthodontics II

1) Crown Preparation

ix. Fixed Prosthodontics III

1) Tissue Management
2) Pontic Design

x. Implant Prosthodontics

1) Introduction
2) Osseointegration
3) Management and Complications

xi. Defect Prosthodontics

1) Maxillofacial Prosthodontics

b. The theory component is covered by three lectures per week in fourth (Final) year
c. Implementation of curriculum is at the discretion of institute. Clerkships/ clinical rotations for 08 weeks' may be followed
d. During their clinical rotation, students in small groups learn through practical chair side demonstrations of the techniques of primary impression making, border molding, secondary impression making, jaw relation record, investing, curing, finishing and polishing, denture try-in, denture insertion and clasp fabrication. They fabricate partial dentures for 12 patients and complete dentures for 8 patients.

4. **Contact Hours:** 250

5. **Resources:**

   To be filled by each Institute

6. **Facilities:**

   To be filled by each Institute

7. **Course Administration**

   To be filled by each Institute

8. **Students Assessment**

   a. Minimum attendance of 75% is a requirement to appear in university professional examination.
   b. Continuous formative evaluation is conducted during the academic year comprising of 5 theory tests, and 2 clinical assessment tests (ward tests and Pre annual). The results are communicated to students through notice board. Feedback is provided after each evaluation.
   c. The weighting of internal assessment is 20% in 4th professional BDS Examination
   a. There will be two mid-term & term examinations followed by a pre-Annual and annual examinations each year.
   b. The structure of the paper of all the term examinations and pre-annual will be the same as that for annual examination though syllabus will be different.
   c. The structure of Mid-term exam will be half of the term exam.
   d. The syllabus for mid-term & term examinations will be announced by the department at least 02 weeks prior to examination.
   e. Pre-annual examination will be from whole syllabus.
   f. The date sheet for mid-term, term and pre-annual examinations will be published by Examination branch while the examinations will be conducted by respective department. The result will be submitted to examination branch for incorporation in internal assessment.
   g. The University shall take the 4th professional Examination at the end of the academic year. Annual Theory will be of 100 marks & Practical Examination will be of 200 marks. The pass score shall be 50% in theory and practical separately. However, in clinical subjects, student should pass in clinical exams / OSCE (with 50% marks) and unobserved stations (with 50% marks) separately
   h. **Log book**
      Each student is expected to maintain record of practical work in log book. Safe keeping (make copies) of the log book is the responsibility of each student. The log book must be submitted to the Prosthodontics department at the end of the academic year.

9. **<u>Communication of Information to Students:</u>** All information communicated to students through Notice boards.

Prosthodontics – Learning Outcomes

Theme/ Topic	Course Content	Learning Outcome		Educational Strategy	Weightings	Assessment Tool
		At the end of each module, student will be able to:				
		Knowledge	**Skill**			
1. Complete Denture Prosthodontics-I						
Systemic Health Aspects and Nutritional Considerations	Oral-systemic conditions that influence an adaptive prosthodontic experience, Systemic lupous erythematosus, burning mouth syndrome, oral movement disorders, salivary dysfunction.	• Enumerate oral-systemic conditions that influence an adaptive prosthodontic experience • Describe management of Systemic lupous erythematosus, burning mouth syndrome, oral movement disorders, salivary dysfunction. • Explain nutritional guidelines for patients undergoing removable prosthodontic treatment • Enlist risk factors for malnutrition in patients with dentures.		Lecture/Self-directed learning/ Assignment	43.5%	MCQ/ SAQ/SEQ
Sequelae of wearing complete dentures	Direct and indirect sequelae caused by wearing removable prosthesis, • Traumatic ulcers • Denture irritation hyperplasia • Denture stomatitis • Kelly's	• Enlist direct and indirect sequelae caused by wearing removable prosthesis • Describe management of: • Traumatic ulcers • Denture irritation hyperplasia • Denture stomatitis • Kelly's syndrome	Identify manifestation of various sequelae in the oral cavity	Lecture/Case-based learning		MCQ/SAQ/ SEQ;

	syndrome • Residual ridge reduction • Xerostomia • Gag	• Residual ridge reduction • Xerostomia • Gag				
Management	History taking, Treatment Planning and Improving Denture-Bearing Areas	• Describe management of abused oral tissues before fabrication of a new denture. • Enlist objectives of pre-prosthetic surgical prescriptions • Explain surgical correction of conditions that preclude optimal prosthetic function • Describe methods used for enlargement of denture bearing areas	• Record a thorough history of an edentulous patient. • Perform extra-oral and intra-oral examination of an edentulous patient. • Propose a treatment plan for an edentulous patient	Lectures; Case-based learning/Chair-side learning		MCQ/SAQ/ SEQ; DOPS
	Additional Treatment Planning for Edentulous and Potentially Edentulous Patients (Overdentures, Immediate Dentures)	• Enlist patients' signs and symptoms that frequently preclude an adaptive complete denture experience • Define overdentures • Enlist advantages and disadvantages of overdentures • Enumerate indications and contraindications for overdentures. • Describe the criteria for selection of teeth as overdenture abutments • Describe preparation of		Lectures		MCQ/SAQ/ SEQ

		overdenture abutments to enhance retention. • Describe long-term complications associated with overdenture abutments. • Define immediate dentures. • Differentiate between various types of immediate dentures • Enumerate advantages and disadvantages of immediate denture treatment • Enlist indications and contraindications to immediate denture treatment • Describe treatment planning protocol for providing an immediate denture • Describe immediate and long-term post-operative care in an immediate denture case.				
	Materials used in management of Edentulous patients	• Describe non-elastic and elastic impression materials • Describe disinfection protocols for various impression materials • Describe	Identify and manipulate various dental materials used in fabrication of dentures	Lectures; Clinical demonstration		MCQ/SAQ/ SEQ; DOPS

		polymeric denture base materials. • Describe injection molding technique • Explain significance of modified resin base materials • Describe materials used in the fabrication of prosthetic teeth • Compare the properties of porcelain and resin teeth • Describe denture lining materials • Enlist indications of tissue conditioners • Describe cast metal alloys used as denture base materials • Describe various types of denture cleansers • Describe adverse reactions to denture cleansers • Enlist indications and contraindications for denture adhesives. • Describe adverse reactions to denture adhesives. • Describe factors that contribute to the retention of dentures				
	Maxillary and mandibular substitutes for denture bearing area	• Name maxillary and mandibular stress- bearing areas • Describe the supporting	• Record primary impression of an edentulous patient	Lecture; case-based learning/chair side learning/		MCQ/SAQ/ SEQ; DOPS

		structures in maxilla and mandible • Describe limiting structures in maxilla and mandible • Enumerate objectives of impression making • Describe preliminary impressions with respect to tray selection, material choice and technique • Describe secondary impressions with respect to tray selection, material choice and technique • Describe theories of impression making • Describe the objectives and sequence of border molding • Define posterior palatal seal • Describe various methods used to record posterior palatal seal • Define boxing of an impression • Define dental cast • Differentiate between various types of casts • Describe the method for fabrication of custom tray	• Pour an impression and produce a master cast • Fabricate a custom tray for an edentulous patient • Perform border molding for a maxillary and mandibular arch. • Record secondary impression for an edentulous patient.	clinical demonstration		
2. Complete Denture Prosthodontics-II						
Denture's	Denture's	• Define surfaces	• Fabricate	Lecture; case-		MCQ/SAQ/

Polished Surfaces	Polished Surfaces, Recording Jaw Relations and their Transfer to an Articulator	and parts of a denture • Describe the method for fabrication of a record base • Define neutral zone • Explain significance of neutral zone in complete dentures • Define jaw relations • Describe various methods used to record vertical and horizontal jaw relations • Define vertical dimension of rest, vertical dimension of occlusion and interocclusal distance • Define centric relation • Describe significance of centric relation in jaw relation record • Enlist affects of increased and decreased vertical dimension of occlusion • Classify articulators • Enumerate advantage and disadvantages of semi-adjustable articulators • Differentiate between ARCON and NON-ARCON articulators • Describe	maxillary and mandibular occlusal rims • Record jaw relation of an edentulous patient • Perform articulation of occlusal rims on a semi-adjustable articulator	based learning/chair-side learning/clinical demonstration		SEQ; DOPS

		programming of an articulator. • Define facebow. • Describe the procedure for recording orientation relation using a facebow. • Enlist advantages and indications of facebow.				
Selection and Arrangement of Prosthetic teeth	The Occlusal Surfaces: Selection and Arrangement of Prosthetic teeth	• Describe various theories for selection of artificial teeth • Classify artificial teeth according to material and occlusal morphology • Enlist landmarks for complete denture teeth setup • Describe anterior tooth setup for maxilla and mandible • Describe posterior tooth setup for maxilla and mandible • Explain various occlusal concepts for complete denture occlusion	Perform complete upper and lower tooth setup for an edentulous patient	Lecture; Skill lab/ demonstration		MCQ/SAQ/ SEQ; DOPS
The Try-in Appointment	Steps involved in denture try-in	• Describe the steps involved in denture try-in	Perform try-in on an edentulous patient	Lecture; case-based learning/chair-side learning/clinical demonstration		MCQ/SAQ/ SEQ;DOPS
Prosthesis Insertion and Follow-up appointments	Protocol for denture insertion Pressure-indicating paste Occlusal equilibration using BULL rule	• Describe the protocol for denture insertion • Enlist indications for use of pressure-indicating paste	• Perform insertion of a complete denture • Instruct a patient about post-	Lecture; case-based learning/chair-side learning/clinical		MCQ/SAQ/ SEQ; DOPS

	protocol for follow-up appointment for a complete denture patient	• Describe various patterns observed while reading pressure-indicating paste • Enlist post-insertion instructions provided to patient about denture care • Describe occlusal equilibration using BULL rule • Describe protocol for follow-up appointment for a complete denture patient	insertion care and handling	demonstration		
3. Complete Denture Prosthodontics-III						
Single Dentures	Single Dentures diagnosis and treatment planning, complications	• Define a single denture • Describe diagnosis and treatment planning for single dentures • Describe possible complications associated with single dentures and their management		Lecture; case-based learning		MCQ/SAQ/ SEQ;
Life span of complete denture	Prolonging the useful life span of complete denture: Relines, Repairs and Duplications	• Differentiate between relining and rebasing • Enlist indications for relining and rebasing • Describe clinical procedures for relining • Describe the physical stages tissue conditioner goes through during setting • Discuss materials available for relining and rebasing		Lecture; case-based learning		MCQ/SAQ/ SEQ;

		• Describe various procedures involved in denture repair • Define copy dentures • Describe the steps involved in fabrication of copy dentures				
Speech Consideration with Complete Dentures	Prosthetic considerations in diagnosing and managing speech problems	• Describe various sounds that may be affected by teeth position • Describe prosthetic considerations in diagnosing and managing speech problems		Lecture; case-based learning		MCQ/SAQ/ SEQ;
4. Removable Partial Prosthodontics-I						
Clasp-Retained Partial Denture	tooth-supported and tooth& tissue supported partial dentures	• Differentiate between tooth-supported and tooth& tissue supported partial dentures • Describe six phases of partial denture service • Enlist reasons of failure of clasp-retained partial dentures			25.5%	
Partially Edentulous Arches	Classification of Partially Edentulous Arches	• Enumerate requirements of an acceptable classification method • Describe Kennedy's classification • Enlist Applegate's rules • Describe advantages and drawbacks of Kennedy's classification	Identify arches according to Kennedy's classification	Lecture; case-based learning		MCQ/SAQ/ SEQ;
Biomechanics of Removable	Possible movements of a	• Describe possible movements of a		Lecture		MCQ/SAQ/

Partial Denture	partial denture and various components that counter these movements	partial denture and various components that counter these movements.				SEQ;
Connectors	Major and Minor Connectors	• Describe principles for design and location of connectors • Describe indications, contraindications and characteristics of various maxillary and mandibular major connectors • Define minor connectors • Describe function, form and location of minor connectors • Define tissue stops and their functions		Lecture; case-based learning		MCQ/SAQ/ SEQ;
5. Removable Partial Prosthodontics-II						
Rests and Rest Seats		• Define rest and rest seat • Classify rests • Enlist advantages of rests • Describe the outline form of an occlusal rest and rest seat • Describe various forms of rests in detail		Lecture; case-based learning		MCQ/SAQ/ SEQ;
Retainers	Direct Retainers	• Define retainers • Classify direct retainers • Describe factors affecting amount of retention • Describe basic principles of clasp design • Enlist indications and		Lecture; case-based learning		MCQ/SAQ/ SEQ;

		contraindications for circumferential and bar clasps • Describe RPI and RPA systems • Describe internal attachments				
	Indirect Retainers	• Define indirect retainers • Describe factors that influence the effectiveness of indirect retainers • Describe auxiliary functions of indirect retainers • Describe various forms of indirect retainers		Lecture; case-based learning		MCQ/SAQ/ SEQ;
Denture Base Considerations	Tooth-supported and tooth & tissue supported denture bases	• Describe functions of tooth-supported and tooth & tissue supported denture bases • Compare advantages and disadvantages of metal and resin denture bases • Describe methods of attaching artificial teeth • Describe stress-breakers		Lecture; case-based learning		MCQ/SAQ/ SEQ;
6. Removable Partial Prosthodontics-III						
Removable Partial Denture Design	Principles of Removable Partial Denture Design	• Describe the difference in prosthesis support and influence on design • Differentiate between two main types of removable partial denture	Design a cast partial denture for a partially dentate patient on model/cast	Lecture; case-based learning; demonstration		MCQ/SAQ/ SEQ; DOPS
Surveying	Surveying	• Define surveying • Differentiate	Identify parts of a surveyor	Lecture; case-		MCQ/SAQ/

		between various types of surveyors • Enlist objectives of surveying • Describe factors which determine the path of placement and removal • Describe tripoding and its types		based learning; demonstration		SEQ;
Management	**Diagnosis and Treatment Planning**	• Enumerate objectives of prosthodontic treatment • Enlist indications for removable partial dentures • Enlist steps involved in diagnosis of a patient • Enlist available prosthodontic treatment options • Describe factors that affect prosthesis selection	• Record history of a partially dentate patient • Perform extra and intra oral examination of a partially dentate patient • Establish a diagnosis and formulate a treatment plan	Lecture; case-based learning/chair side learning/ clinical demonstration/ Role play		MCQ/SAQ/ SEQ; DOPS
	Preparation of Mouth for Removable Partial Dentures	• Describe oral surgical preparation for removable partial denture patient • Describe conditioning of abused and irritated oral tissues		Lecture; case-based learning;		MCQ/SAQ/ SEQ;
7. Fixed Prosthodontics-I						
History taking and Examination in dentistry	**History taking and Clinical Examination**	• Describe Prosthodontic Diagnostic Index for partially dentate and completely dentate patient	• Record history for a prospective fixed prosthesis patient • Perform	Lecture; case-based learning; Role play	20%	MCQ/SAQ/ SEQ;

			examination of a prospective fixed prosthesis patient			
Treatment Planning	• treatment options for: • A single missing tooth • Missing tooth with mesially tilted abutments • Pier abutments • Ante's Law • factors which affect replacement of multiple missing teeth	• Describe treatment options for: • A single missing tooth • Missing tooth with mesially tilted abutments • Pier abutments • Describe Ante's Law • Describe factors which affect replacement of multiple missing teeth		Lecture; case-based learning;		MCQ/SAQ/ SEQ;
Important principles	Various principles of Occlusion	• Describe Posselt's envelope of motion • Enumerate the determinants of mandibular movement • Describe various occlusal schemes for fixed prosthodontics		Lecture		MCQ/SAQ/ SEQ;
	Principles of Tooth Preparation	• Describe biological considerations of tooth preparation • Describe mechanical considerations of tooth preparation • Describe advantages of supragingival margins • Describe indications for subgingival margins		Lecture; case-based learning;		MCQ/SAQ/ SEQ;

		• Compare different margin designs • Describe esthetic considerations of tooth preparation				
8. Fixed Prosthodontics-II						
Crown Preparation	The Complete Cast Crown Preparation	• Enlist advantages, disadvantages, indications and contraindications of complete cast crown • Describe steps of complete cast crown preparation	Perform complete cast crown preparation on a typodont.	Lecture; Skill lab/Dental simulators		MCQ/SAQ/ SEQ; DOPS
	The Metal - Ceramic Crown Preparation	• Enlist advantages, disadvantages, indications and contraindications of metal-ceramic crown • Describe steps of metal-ceramic crown preparation	Perform metal-ceramic crown preparation on a typodont.	Lecture; Skill lab/Dental simulators		MCQ/SAQ/ SEQ; DOPS
	The All - Ceramic Crown Preparation	• Enlist advantages, disadvantages, indications and contraindications of all-ceramic crowns and veneers • Describe steps of all-ceramic crown and veneer preparation	Perform all-ceramic crown and veneer preparation on a typodont.	Lecture; Skill lab/Dental Simulators		MCQ/SAQ/ SEQ; DOPS
9. Fixed Prosthodontics-III						
Fixed Prosthodontics	Tissue management and Impression making	• Describe various methods for isolation/saliva control • Describe various methods for		Lecture		MCQ/SAQ/ SEQ;

		displacement of gingival tissues • Describe recommended disinfection methods according to impression materials				
Fixed Prosthodontics	Pontic Design	• Describe biologic, mechanical and esthetic considerations for successful pontic design • Classify pontics • Enlist indications, contraindications , advantages and disadvantages of various pontic designs		Lecture; case-based learning;		MCQ/SAQ/ SEQ;
10.Implant Prosthodontics						
Introduction	Introduction to Dental Implantology	• Define dental implant • Define components of a dental implant assembly • Classify dental implants • Enlist differences between teeth and implants		Lecture;	6%	MCQ/SAQ/ SEQ;
osseointegration	The Science of osseointegration	• Define osseointegration • Describe factors that determine success and failure of osseointegration		Lecture;		MCQ/SAQ/ SEQ;
Management/ Complications in Implant Prosthodontics	Fixed Full Arch Implant Supported Prostheses for Edentulous patient	• Describe treatment options for edentulous maxilla • Describe treatment options for edentulous mandible		Lecture; case-based learning;		MCQ/SAQ/ SEQ;

	Managing Problems and Complications	• Enlist possible problems and complications associated with dental implants		Lecture; case-based learning;		MCQ/SAQ/ SEQ;
	Implant overdentures	• Describe inclusion and exclusion criteria for implant treatment • Describe various available implant supported overdenture treatment options • Enumerate indications for ball, magnetic and bar attachments		Lecture;		MCQ/SAQ/ SEQ;
11.Defect Prosthodontics						
Maxillofacial Prosthodontics	Maxillofacial Prosthodontics for Edentulous patient	• Describe prosthetic considerations for edentulous maxillofacial prosthesis • Describe Aramany's classification for partially edentulous maxillectomy dental arches • Describe Cantor and Curtis classification for partially edentulous mandibulectomy dental arches • Differentiate between various types of maxillary obturator prosthesis • Describe troubleshooting an obturator for:		Lecture; Case-based learning	5%	MCQ/SAQ/ SEQ;

		• Lack of retention • Nasal reflux • Hypernasality • Enlist types of soft palate prostheses • Describe prosthodontic treatment considerations for irradiated edentulous and partially dentate patients				

CURRICULUM

FOR

OPERATIVE

DENTISTRY (2025)

National University of Medical Sciences
Pakistan

1. Context / Preamble

Operative dentistry is a specialty within dentistry that deals with the that phase of dentistry concerned with restoration of parts of the teeth that are defective through disease, trauma, or abnormal development to a state of normal function, health, and esthetics, including preventive, diagnostic, biological, mechanical, and therapeutic techniques, as well as material and instrument science and applications in all age groups. It also includes the field of endodontics related to prevention and treatment of pulpal and periapical diseases.

This undergraduate Operative dentistry curriculum is designed to train Bachelor of Dental Surgery (BDS) students to provide restorative and endodontic services in the practice of general dentistry. This mainly involves diagnosis and management of dental caries and management by different type of restorations and it also deals with diagnosis and management of teeth with pulpal and peri- apical diseases. They would also be able to manage Dental trauma.

Operative dentistry is a major subject of final professional BDS examination and carries a total of 300 marks.

2. **Mission:** The mission of this course is to familiarize BDS students with the basic knowledge, skills and attitudes for safe practice of operative dentistry and endodontic procedures in dental clinics.
3. **Competencies:** The following generic competencies apply to this operative dentistry course:
   - Critical Thinking
   - Problem Solving
   - Communication Skills
   - Professionalism
   - Procedural Skills
4. **Learning Outcomes:** Specific Learning outcome of each course is attached as Annex A.
5. **Contact Hours:** 250
6. **Implementation of the curriculum:**
7. **Overview:**
   a. The Operative dentistry is divided into three main blocks with 23 different themes taught sequentially as given below:

1) CONSERVATIVE DENTISTRY

INTRODUCTION

- Clinical significance of dental anatomy and histology

CARIOLOGY

- Dental caries: etiology and clinical significance, risk assessment and management

Patient assessment, examination, diagnosis and treatment planning

STERILIZATION AND INFECTION CONTROL IN DENTAL OFFICE

- Methods of disinfection and sterilization
- CDC guidelines
- Cross Infection Control

DENTAL BIOMATERIALS

- Optimal characteristics and Implications in Dentistry

CAVITY PREPARATIONS AND RESTORATIONS FOR DENTAL AMALGAM

- Classification and clinical considerations
- Applied Chemistry
- Clinical techniques for amalgam restorations (fundamentals of tooth preparation for dental amalgam)
- Mercury Toxicity and Hygiene
- Complex Amalgam Restorations
- Pin-Retained Restorations

CAVITY PREPARATIONS AND RESTORATIONS FOR DENTAL COMPOSITES

- Composite resin: Applied chemistry
- Color and Shade Matching in Restorative Dentistry
- Fundamentals of tooth preparation for composite
- Fundamental concepts of enamel and dentine adhesion
- Recent trends in dentistry

OCCLUSION

- Occlusion and Occlusal Records

NON-CARIOUS CERVICAL LESIONS (NCCLs)

- Classification based on Etiology.
- Clinical features of NCCLs.
- Abrasion
- Attritio
- Erosion
- Abfraction
- Management of NCCLs.
- Diagnosis and management of tooth wear

TOOTH DISCOLOURATIONS AND ADDITIONAL AESTHETIC DENTAL PROCEDURES

- Discoloration of teeth.
- Bleaching -Internal & External.
- Macro abrasion.
- Micro abrasion.

RADIOLOGY

Use and implications of:

- Periapical Radiographs
- Bitewing Radiographs
- Occlusal Radiographs
- OPG
- CBCT

MANAGEMENT OF MEDICALLY COMPROMISED PATIENTS (SPECIFIC REFERENCE TO HIV AND HEPATITIS)

TRAUMA TO THE PERMANENT DENTITION

8. INDIRECT SINGLE TOOTH RESTORATIONS

INLAYS AND ONLAYS

- Contemporary onlay preparation, impressioning and bonding

VENEERS

- No prep veneers
- Etched porcelain veneers
- Pressed ceramic veneers

DIGITAL DENTISTRY

CAD-CAM RESTORATIONS

CAST, POST AND CORE RESTORATIONS

9. ENDODONTICS

DIAGNOSIS AND TREATMENT PLANNING FOR ENDODONTICS

CLINICAL CLASSIFICATION AND PATHOBIOLOGY OF PULPAL AND PERIRADICULAR TISSUES

Clinical classification of Pulpal Conditions

- Normal Pulp
- Reversible Pulpitis
- Irreversible Pulpitis
- Pulp Necrosis

Clinical classification of Periapical Conditions

- Normal Periapex
- Symptomatic Apical Periodontitis
- Asymptomatic Apical Periodontitis
- Acute Apical Abscess
- Chronic Apical Abscess
- Condensing osteitis

OTHER PATHOSIS AFFECTING PULPAL TISSUES AND MIMICKING PULPAL DISEASES

- Endo-Perio lesions
- Resorption (Internal and External Resorption)
- Calcific Metamorphosis
- Non-odontogenic toothache

PREPARATION FOR ENDODONTIC TREATMENT

- Endodontic armamentarium
- Isolation
- Pain Control (Local Anesthesia)

ENDODONTIC THERAPY

- Endodontic access and length determination
- Chemo-mechanical debridement (cleaning and shaping)
- Irrigants and Intracanal medicaments
- Obturation of root canal system

RESTORATION OF ENDODONTICALLY TREATED TEETH

- Criteria for a restorable tooth
- Complications associated with endodontically treated teeth
- Structural, Esthetic and Restorative Considerations
- Use of Posts (clinical significance

EVALUATION OF ENDODONTIC OUTCOMES AND OTHER TREATMENT MODALITIES

- Evaluation of endodontic outcomes
- Non-surgical retreatment
- Peri radicular Surgery/Apical Microsurgery
- Systemic health considerations in Endodontic Patient and Geriatric Endodontics
- Revascularization

ENDODONTIC EMERGENCIES

- Endodontic emergencies
- Root fractures
- The theory component is covered by two lectures per week in fourth (Final) year.
- Implementation of curriculum is at the discretion of institute. Clinical rotations for 07 weeks may be followed.
- During their clinical rotation, students perform the following procedures on patients as a part of chairside training
    a. Caries risk assessment

b. local anesthesia administration

c. Class I, Class II cavity preparation, condensation, burnishing and finishing of Amalgam restorations

d. Cavity preparations, placement, finishing and polishing of Class III, Class IV and Class V cavities with composite restorations

e. Class I, Class II Amalgam restorations and Class III, IV and V composite restorations

f. They also perform 05 cases of endodontic therapy on extracted teeth.

g. Treatment planning

- They also perform the following procedures on phantom head teeth.

h. Veneer preparations

i. Onlay preparations

7. Resources:

- **Infrastructure resources:**
  a. Phantom Lab
  b. Clinical Department
  c. Lecture Halls
  d. Conference Room
  e. Clinical case discussion room
- **Human resources:**
  a. Professor
  b. Associate Professor
  c. Assistant Professor
  d. Senior registrar
  e. Demonstrators
  f. Post Graduate residents

8. Facilities:

- To be filled by each Institute

9. Course Administration:

- Didactic
- Clinical
  a. Clinical Demonstrations.
  b. Small group discussions.
  c. Phantom lab.
  d. Extracted teeth.
  e. Practice on patients

10. Students Assessment:

a. Minimum attendance of 75% is a requirement to appear in university professional examinations.

b. Students are expected to perform fillings of teeth as recommended by PM&DC during their clinical duty in 4th Year BDS and successfully complete practical exercises and assignments.

c. Continuous formative evaluation is conducted during the academic year consisting of 5 theory tests, and 2 clinical assessment tests (Pre-annual and Annual). The results are communicated to students through a notice board. Feedback is provided after each evaluation.
d. The weighting of internal assessment is 20% in 4th professional BDS Examination
e. There will be one mid-term followed by a pre-annual and annual examination each year.
f. The structure of the paper of the term examination and pre-annual will be the same as that for the annual examination though the syllabus will be different.
g. The structure of the Mid-term exam will be half of the term exam.
h. The syllabus for mid-term will be announced by the department at least 02 weeks prior to
i. examination.
j. Pre-annual examination will be from the whole syllabus.
k. The date sheet for mid-term and pre-annual examinations will be published by the Examination branch while the examinations will be conducted by respective departments. The result will be submitted to the examination branch for incorporation in internal assessment.
l. The University shall take the 4th professional Examination at the end of the academic year. Annual
m. Theory will be of 100 marks & Practical Examination will be of 200 marks. The pass score shall be 50% in theory and practical separately. However, in clinical subjects, student should pass in clinical exams / OSCE (with 50% marks) and unobserved stations (with 50% marks) separately

n. <u>Log book</u>

Each student is expected to maintain a record of practical work in a log book. Safe keeping (make copies) of the log book is the responsibility of each student. The log book must be submitted to the Operative dentistry department at the end of the academic year.

11. Communication of Information to Students:

All information communicated to students through Notice boards, text messages, websites, multimedia forums and learning platforms.

12. Learning Resources

Recommended Textbooks

- The Art & Science of Operative Dentistry by Sturdevant
- Fundamentals of Operative Dentistry by Schwartz
- Harty's Endodontics in Clinical practice.
- Pathway of the Pulp by Cohen
- Essentials of Dental Radiography & Radiology by Frickwhaite

Topic/theme	Course Content	Learning Outcomes At the end of each module, student will be able to:		Instructional Strategies	%
		Knowledge	Skills		
INTRODUCTION	Clinical significance of dental anatomy and histology.	● Interpret the structural composition of human teeth, including enamel, dentin, pulp, cementum and periodontal ligament and their roles in tooth function and health. ● Identify different types of teeth in the dentition, their anatomical features and role in mastication and speech. ● Describe the microscopic structure of dental tissues and their significance in dental health and disease.	● Carve out occlusal anatomy in wax patterns.	Lecture / Self-directed Learning / Assignment	
CARIOLOGY	Dental caries: etiology and clinical significance, risk assessment and management Patient assessment, examination, diagnosis and treatment planning	● Define dental caries and its different types. ● Interpret the pathophysiology of dental caries and its etiology. ● Identify and explain methods of diagnosing dental caries. ● Describe the clinical characteristics of different carious lesions.	● Identify type and class of dental caries. ● Classify patients according to caries risk. ● Formulate treatment plan according to the medical model for dental caries management. ● Perform patient	Lecture/ Case-based Learning/ chairside learning	

		● Elaborate the significance of caries risk assessment in patients. ● Describe the management of caries according to risk assessment. ● Highlight clinical considerations in caries prevention.	counseling for caries prevention according to caries risk.		
STERILIZATION AND INFECTION CONTROL IN DENTAL OFFICE	Methods of disinfection and sterilization CDC guidelines Cross Infection Control	● Define key terms related to sterilization and infection control. ● Identify various types of microorganisms commonly found in the dental office environment, and their potential implications for patient and staff safety. ● Outline the principles of infection control in the dental setting ● Discuss regulatory guidelines and standards governing sterilization and infection control in the dental practice (OSHA/CDC) ● Discuss and evaluate effective methods for infection control and sterilization	● Demonstrate hand hygiene and proper handwashing technique. ● Practice cross infection control according to CDC guidelines. ● Demonstrate use of PPE in the dental office ● Practice safe disposal of waste and sharps.	Lecture / Case-based learning/ Chair-side learning	
CAVITY PREPARATIONS AND	Classification and clinical considerations.	● Discuss the use of dental amalgam as a restorative	● Perform all steps of class 1 and class 2	Lecture/ Clinical demonstration /	

RESTORATIONS FOR DENTAL AMALGAM	Applied Chemistry. Clinical techniques for amalgam restorations (fundamentals of tooth preparation for dental amalgam) Mercury Toxicity and Hygiene. Complex Amalgam Restorations. Pin-Retained Restorations.	material with specific consideration to material properties and their clinical significance ● Comprehend the concept of mercury toxicity ● Explain the safe use of amalgam in the dental office, focusing on effective waste disposal ● Enumerate and describe the clinical technique and steps of cavity preparation for amalgam restorations (including class 1 and class 2 restorations) ● Outline the features of individual steps of cavity preparation ● Discuss reasons for incorporating tooth preparation features for these steps. ● Describe the clinical relevance of steps of restoration including carving, burnishing, polishing and finishing of amalgam restorations. ● Highlight cases for repair or replacement of amalgam restorations. ● Describe the use and significance and use	amalgam cavity preparation. ● Demonstrate steps for finishing and polishing of amalgam restorations. ● Practice matrix placement and removal, along with wedge placement and removal. ● Demonstrate different wedging techniques ● Practice proper waste disposal of amalgam	Chairside learning.	

		of different wedging techniques and matrix placement during tooth restoration. ● Outline the indications, contraindications, advantages and disadvantages of complex amalgam restorations. ● Enumerate various dentinal pin systems. ● Discuss the factors affecting the retention of pins in dentin and amalgam. ● Describe the principles of pin placement. ● Explain the procedure of pin placement			
CAVITY PREPARATI ONS AND RESTORATI ONS FOR DENTAL COMPOSITE S	**Composite resin: applied chemistry** Color and Shade Matching in Restorative Dentistry. Fundamentals of tooth preparation for composite resins. Fundamental concepts of enamel and dentine adhesion. Recent trends in Dentistry	● Describe and explain important concepts of enamel and dentin adhesion. ● Highlight the challenges and clinical considerations in dentin bonding. ● Enumerate different dentin bonding systems ● Describe and differentiate between the concept of microleakage and nanoleakage ● Enumerate indirect adhesive restorations. ● Highlight composition and	● Perform shade matching for composite restorations. ● Perform cavity preparation for class 1,2,3,4,5 and 6 direct composite restorations. ● Demonstrate the placement, finishing and polishing of class 1,2,3,4,5 and 6 direct composite restorations.	Lecture/ case-based learning/ chair-side learning/ clinical demonstration	

		classification of composites. ● Describe the manipulative variables with respect to composite resins. ● Explain the concept of color perception, deficiency and dimensions with regard to colour related properties of tooth and restorative materials. ● Enumerate various color matching tools, instruments and techniques. ● Describe the various clinical considerations for composite resin, focusing on reaction properties of the composite. ● Outline the clinical technique for pits and fissure sealants, preventive resin restorations and caries control restorations. ● Outline steps of clinical technique for class 1,2,3,4,5 and 6 direct composite restorations. ● Highlight the clinical relevance of finishing, polishing and repair of composite restorations.			

OCCLUSION	Occlusion and occlusal records.	• Define and explain key concepts in dental occlusion with their clinical relevance.	• Demonstrate different procedures used for taking occlusal relationships necessary for constructing restorations.	Lecture/ Case-based Learning/ Chair-side Learning/ clinical demonstration.	
NCCLs	Classification based on Etiology Clinical features of NCCLs. Management of NCCLs. Diagnosis and management of tooth wear.	• Classify NCCLs and explain its etiology. • Describe the clinical features of: - Abrasion - Attrition - Erosion - Abfraction • Enumerate set of investigations to reach the diagnosis of NCCLs. • Highlight the restorative management of NCCLs. • Enlist indications for mucogingival surgery with respect to NCCLs • Highlight clinical performance of adhesives in NCCLs.	• Diagnose and classify NCCLs. • Perform restorative management of NCCLs. • Perform patient counseling on different methods for prevention of NCCLs.	Lecture; Skill lab/ demonstration / chairside learning.	
TOOTH DISCOLORATION AND ADDITIONAL AESTHETIC DENTAL PROCEDURES	Discoloration of teeth. Bleaching: Internal vs External Macroabrasion Microabrasion	• Describe the clinical considerations (indications & contraindications) for tooth discoloration • Discuss correction of diastema. • Describe the etiology of tooth discoloration • Explain the mechanism of	• Identify and classify different types of discoloration of teeth. • Perform patient counseling on the different techniques	Lecture/ Case-based Learning/ chair-side learning/clinical demonstration.	

		bleaching, use of different bleaching agents ● Differentiate between vital and non-vital bleaching techniques. ● Describe the clinical procedure for micro and macro abrasion.	used for treating discolored teeth. ● Explain different types of bleaching techniques to the patients with risks and benefits. ● Demonstrate the steps for performing different types of bleaching. ● Demonstrate the steps for diastema closure. ● Demonstrate the steps for micro and macro abrasion.		
RADIOLOGY	Clinical and practical considerations of dental radiology.	**Describe the use and implications of** ● Periapical Radiographs ● Bitewing Radiographs ● Occlusal Radiographs ● OPG ● CBCT in the dental office	● Interpret OPG , bitewing and periapical radiographs. ● Practice bitewing and periapical radiographs. ● Interpret errors & how to rectify them in periapical radiograph.	Lecture/ Case-based Learning/ Chairside learning.	
MANAGEMENT OF MEDICALLY	Management of medically	● Describe the guidelines for	● Identify the factors	Lecture/ Case-	

COMPROMIS ED PATIENTS	compromised patients with special reference to HIV and hepatitis.	management of patients with HIV with reference to restorative dental procedures. ● Discuss the guidelines for management of patients with Hepatitis with reference to restorative dental procedures.	related to medically compromised patients ● Demonstrate the necessary prerequisites for handling the patients before performing any operative procedures.	based Learning/ chairside learning.	
TRAUMA TO THE PERMANEN T DENTITION	Classification, management, and diagnosis of dental traumatic injuries.	**Highlight the classification for:** ● Crown fractures ● Root fractures ● Luxation injuries ● Avulsion ● Alveolar fractures Enumerate the techniques for diagnosis of traumatic injuries Discuss the management strategies for different types of traumatic injuries.	● Perform diagnostic tests and procedures used in examination and interpretation of dental traumatic injuries. ● Counsel patients for appropriate treatment strategies for various traumatic injuries.	Lecture/ Case-based Learning/ chairside learning	
INLAYS AND ONLAYS	Tooth preparation and restorative techniques for Class II cast metal restorations.	● Describe the steps of tooth preparation of class II cast metal inlay. ● Describe the steps of tooth preparation of full cast metal onlay. ● Explain the restorative techniques for cast metal restorations.	● Case selection for class II metal inlay and full metal onlay on patients. ● Practice steps of tooth preparation for class II metal inlay and full metal	Lecture/ Case-based Learning/ chairside learning	

		● Describe the stages of laboratory fabrication of cast metal restoration.	onlay on phantom teeth.		
VENEERS	No prep veneers Etched porcelain veneers Pressed ceramic veneers	● Enlist the types of veneers. ● Discuss indications, contraindications alongwith clinical considerations of veneers. ● Describe step by step technique for direct partial and full veneers. ● Describe the technique for indirect veneers. ● Explain the concept of provisionalization and repair of veneers.	● Perform case selection for veneers. ● Demonstrate techniques for different types of veneers on phantom teth.	Lecture/ Case-based Learning/ Chairside learning.	
DIGITAL DENTISTRY	CAD-CAM systems Tooth preparation, digital impressions, and materials for cad cam restorations.	● Highlight clinical applications of CAD-CAM ● Discuss tooth preparation principles for CAD CAM restorations. ● Enlist the chairside restorative materials used in CAD CAM ● Highlight the significance of digital impression and I/O scanning. ● Discuss longevity of CAD CAM restorations.	Demonstrate material selection and steps of tooth preparation for cad cam restorations on phantom teeth.	Lecture/ Case-based Learning	
Cast, Post and Core Restorations	Preparation of canal space and tooth for post placement. Post and core systems for	● Describe the prerequisites for case selection for cast post and	● Perform Case selection for post and core restorations.	Lecture/ Case-based learning/ Chairside learning.	

	anterior and posterior teeth.	core restorations ● Discuss the use of different types of posts in endodontically treated teeth	● Demonstrate post space preparation on extracted teeth.		
DIAGNOSIS AND TREATMENT PLANNING FOR ENDODONTICS	Diagnosis and Treatment Planning History and Clinical Examination/ Radiographic analysis. Diagnostic Procedures.	Describe the diagnosis focusing on: ● Presenting complaints and history. ● Subjective, objective and radiographic examination. ● Special tests. ● Selective anesthesia. ● Longitudinal crown fractures. Highlight the treatment choices, focusing on prognosis of teeth	● Interpret subjective, objective and radiographic findings for pulpal and peri radicular pathosis. ● Perform all steps of clinical examination for pulpal and periapical pathosis. ● Demonstrate pulp and periapical diagnostic tests.	Lecture/ case-based learning/ chairside learning.	
BIOLOGY OF DENTAL PULP	Structure and function of dentin-pulp complex. Pulpal reaction to dental caries, restorative materials and treatment.	Discuss and explain the physiological functions of dental pulp and supporting tissues, highlighting its relevance in the detection of disease	● Perform patient counseling for prevention and management strategies for dentin hypersensitivity .	Lecture/ case-based Learning	
CLINICAL CLASSIFICATION AND PATHOBIOLOGY OF PULPAL AND	Clinical classification of Pulpal Conditions. • Normal Pulp. • Reversible Pulpitis.	● Describe and explain the etiology and classification of pulpal and	● Diagnose and distinguish between clinical and histologica	Lecture/ case-based learning/ Chairside learning.	

PERIRADICULAR TISSUES.	• Irreversible • Pulpitis. Pulp Necrosis. • Clinical classification of Periapical Conditions. • Normal Periapex. • Symptomatic • Apical Periodontitis. • Asymptomatic Apical Periodontitis. • Acute Apical Abscess. • Chronic Apical Abscess. • Condensing osteitis.	periradicular diseases ● Discuss in detail the parameters in the healing of peri radicular lesions. ● Enumerate the non endodontic peri- radicular pathosis.	l features of pulpal and peri radicular pathosis. ● Formulate treatment plan for manageme nt of; • Symptomatic Apical Periodontitis. • Asymptomatic Apical Periodontitis. • Acute Apical Abscess. • Chronic Apical Abscess. • Condensing osteitis.		
OTHER PATHOSIS AFFECTING PULPAL TISSUES AND MIMICKING PULPAL DISEASES	Endo-Perio Lesions Resorption (Internal and External Resorption) Calcific Metamorphosis Non-odontogenic toothache.	● Describe the pathways of communicatio n between the dental pulp and periodontium. ● Explain the effect of endodontically involved teeth on periodontium. ● Explain the effect of periodontal diseases and procedures on dental pulp. ● Define and classify endo-perio lesions. ● Differentiate between internal and external root resorption. ● Describe the diagnosis, mechanism	● Identify diagnostic findings which are of importance in differentiatin g conditions which will respond to root canal treatment and those which will require periodontal therapy. ● Establish treatment sequencing according to diagnostic	Lecture/ case-based learning/ Chairside learning.	

		and versatility of orofacial pain. ● Differentiate between superficial vs deep pain. ● Highlight classification of orofacial pain. ● Describe the diagnostic procedures for non-odontogenic toothache.	findings for endo perio lesions. ● Diagnose calcific metamorphosis and internal and external root resorption on the basis of radiographic and clinical findings. ● Differentiate between superficial and deep pain and relate this to the difference between pulpal, periodontal and peri radicular pain. ● Perform history and diagnostic tests to help clarify difficult diagnosis related to orofacial pain.		
PREPARATION FOR ENDODONTIC TREATMENT	Endodontic armament arium Isolation Pain Control (Local Anesthesia)	● Describe the physical characteristics of endodontic instruments. ● Enumerate instruments for intracanal usage and obturation.	● Identify the basic set of instruments for diagnosis, access cavity, canal preparation, obturation and bleaching.	Lecture/ case-based learning/ Chairside learning.	

		● Enlist adjunctive instruments for use in endodontics ● Enumerate reasons for use of rubber dam during endodontics. ● Describe the preparation, equipment and application of the rubber dam. ● Explain factors affecting endodontic anesthesia. ● Highlight different techniques for effective pain control in endodontics with specific focus on supplemental anesthesia	● Demonstrate proper use of instruments to prevent breakage. ● Identify and differentiate between conventional files and alternative files. ● Clamp selection for anterior and posterior teeth. ● Step by step preparation and application of rubber dam. ● Demonstrate patient management techniques for obtaining optimal anesthesia. ● Perform conventional techniques for local anesthesia.		
ENDODONTIC THERAPY	Endodontic access and length determination Chemo-mechanical debridement (cleaning and shaping)	● Describe the major objectives, techniques and errors in access cavity preparation. • Enumerate techniques for working length determination in endodontics.	● Demonstrate step by step technique for obtaining initial and final working length. ● Perform access cavity preparation	Lecture/ case-based learning/ Chairside learning.	

	Irrigants and intracanal medicaments Obturation of root canal system. Endodontic failure.	● Describe and explain the objectives, techniques and errors in cleaning and shaping. ● Describe the use of chemical adjuncts and intracanal medicaments. ● Outline and explain the objectives, suitable timing and various techniques of obturation. ● Enumerate the various core obturating materials, alongwith their clinical relevance ● Highlight the use of sealers in endodontic practice ● Describe the prerequisites for evaluation of quality of obturation, focusing on resolution of symptoms. ● Recall etiology and outline prevention & management of endodontic treatment failure.	for anterior and posterior teeth on extracted teeth and patients. ● Demonstrate techniques step by step for standardized and flaring preparations. ● Demonstrate technique of pulp extirpation. ● Demonstrate techniques for negotiating curved or blocked canals. ● Demonstrate use of intracanal medicaments. ● Demonstrate preparation of canal for obturation and sealer placement. ● Demonstrate GP cone selection. ● Demonstrate lateral condensation ● Identify the cases with endodontic failure.		

RESTORATION OF ENDODONTICALLY TREATED TEETH	Criteria for a restorable tooth Complications associated with endodontically treated teeth. ● Structural, Esthetic and Restorative Considerations. ● Use of Posts (clinical significance).	● Describe and explain structural and biomechanical considerations for restoration of endodontically treated teeth. ● Highlight the clinical relevance of timing, design, preparation and retention of restorations. ● Enumerate the types of temporary restorations ● Enlist the different post and core systems.	● Formulate treatment plan with options for direct and indirect restorations. ● Describe techniques for restoring access through pre-existing restorations. ● Perform case selection for post and core restorations.	Lecture/ case-based learning/ Chairside learning.	
EVALUATION OF ENDODONTIC OUTCOMES AND OTHER TREATMENT MODALITIES	Evaluation of endodontic outcomes Non-surgical retreatment Periradicular Surgery/Apical Microsurgery. Systemic health considerations in Endodontic Patient and Geriartic Endodontics. Revascularization.	● Define and explain the concept of "endodontic prognosis" ● Enumerate and explain factors influencing success and failure of root canal treatment. ● Describe the causes of endodontic failures and retreatment. Highlight the methods of evaluation of root canal treatment. ● Discuss the appropriate case selection and retreatment techniques in endodontics. ● Discuss the indications and contraindications for periradicular surgery. ● Highlight the key relevance of various	● Determination of endodontic and restorative prognosis and counseling of the patient accordingly. ● Perform Case selection for retreatment and referral. ● Communication of risks vs benefits, alternative treatments and reasons for retreatment or referral to the patients. ● Perform case selection for peri radicular surgery. ● Demonstrate step by step	Lecture/ Case-based Learning/ Chairside learning.	

		surgical procedures : root amputation, hemi section and bicuspidization. ● Describe the relevance and need of corrective surgery ● Describe the pulp and periodontal response as a consequence of aging ● Explain diagnosis and treatment planning for medically compromised patients. ● Describe clinical consideration s in a Geriartic Patient : Root canal treatment, restoration, retreatment, endodontic surgery and trauma. ● Explain the concept of regenerative endodontic procedures - indications, approach, protocol and limitations.	diagnosis and treatment planning for geriatric and medically compromised patients. ● Perform Case selection and demonstrate clinical protocol for regenerative endodontic procedures.		
ENDODONTIC EMERGENCIES	Endodontic emergencies Root fractures	● Define and categorize different endodontic emergencies. ● Deduce the diagnosis and treatment plan	● Demonstrate a sequential approach for prevention and management of endodontic emergencies. ● Demonstrate steps involved	Lecture/ Case-based Learning/ Chairside learning.	

		for endodontic emergencies ● Highlight pretreatment, interappointment and post obturation emergencies ● Classify and explain various longitudinal tooth fractures, with specific consideration to its management: Fractured cusp Cracked tooth Split tooth Vertical root fractures	in management of acute irreversible pulpitis, necrotic pulp with acute apical periodontitis and acute apical abscess. ● Diagnose and counsel patients for management options for craze lines, fractured cups, split tooth and vertical root fractures.		

CURRICULUM

FOR

ORAL & MAXILLOFACIAL SURGERY

(2025)

National University of Medical Sciences

Pakistan

1. Context / Preamble

Oral and maxillofacial surgery is a specialty within dentistry that deals with the diagnosis and surgical management of diseases, disorder, deformities, injuries and esthetic aspects of the mouth, teeth, jaws and face.

This undergraduate Oral and Maxillofacial Surgery curriculum is designed to train Bachelor of Dental Surgery (BDS) students to provide minor oral surgery services in the practice of general dentistry. This mainly involves safe extraction of teeth (Exodontia), treatment of minor soft and hard tissue injuries (Trauma), diagnosis and treatment of routine oral and dental infections, defects and pathologies of the region, and the diagnosis and referral of major problems to the concerned specialists.

Oral and Maxillofacial Surgery is a major subject of final professional BDS examination and carries a total of 300 marks.

2. Mission

The mission of this course is to familiarize BDS students with the basic knowledge, skills and attitudes for safe practice of minor oral surgical procedures in dental clinics.

3. Competencies

The following generic competencies apply to this oral & maxillofacial Surgery course:

- Critical Thinking
- Problem Solving
- Communication Skills
- Professionalism
- Procedural Skills

4. Learning Outcomes

Specific Learning outcome of each course is attached as Annex A

5. Implementation of the curriculum

Overview

1. The Oral and Maxillofacial Surgery curriculum is divided into 10 courses or modules, taught sequentially as given below:
    a. Medically compromised conditions and their management
    b. Basic principles of surgery
    c. Exodontia
    d. Odontogenic & maxillofacial infections
    e. Oral & maxillofacial trauma
    f. Oral & maxillofacial pathology
    g. Oral & maxillofacial deformity

h. Preprosthetic and implant surgery

i. Temporomandibular and facial pain disorders.

j. Management of hospitalized patients

2. Implementation of curriculum is at the discretion of institute. Clerkships/ clinical rotations for 08 weeks' may be followed

3. During their clinical rotation, students in small groups learn through practical chair side demonstrations of the techniques of local anesthesia administration, dental extractions, soft tissue suturing and wiring and splinting techniques for dento alveolar injuries on dental models. They then perform dental extractions on patients under supervision. They also observe and assist seniors in other minor oral surgical procedures under local anesthesia,

6. Contact Hours: 250

7. Resources

To be filled by each institute

8. Facilities

To be filled by each institute

9. Course Administration

To be filled by each institute

1) Examination.

a. Minimum attendance of 75% is a requirement to appear in university professional examination

b. Continuous formative evaluation is conducted during the academic year comprising of 5 theory tests, and 2 clinical assessment tests (ward tests and Pre annual). The results are communicated to students through notice board. Feedback is provided after each evaluation

c. The weighting of internal assessment is 20% in 4th professional BDS Examination

d. There will be two mid-term & term examinations followed by a pre-Annual and annual examinations each year.

e. The structure of the paper of all the term examinations and pre-annual will be the same as that for annual examination though syllabus will be different.

f. The structure of Mid-term exam will be half of the term exam.

g. The syllabus for mid-term & term examinations will be announced by the department at least 02 weeks prior to examination.

h. Pre-annual examination will be from whole syllabus.

i. The date sheet for mid-term, term and pre-annual examinations will be published by Examination branch while the examinations will be conducted

by respective department. The result will be submitted to examination branch for incorporation in internal assessment.

j. The University shall take the 4th professional Examination at the end of the academic year. Annual Theory will be of 100 marks & Practical Examination will be of 200 marks. The pass score shall be 50% in theory and practical separately. However, in clinical subjects, student should pass in clinical exams / OSCE (with 50% marks) and unobserved stations (with 50% marks) separately

k. **Log book.** Each student is expected to maintain record of practical work in log book. Safe keeping (make copies) of the log book is the responsibility of each student. The log book must be submitted to the surgery department at the end of the academic year.

Communication of Information to Students

All information is communicated to students through notice boards.

Recommended Textbooks

- Contemporary Oral & Maxillofacial Surgery. 6th Edition 2013. Peterson, Ellis, Hupp, Tucker
- Handbook of Local Anesthesia. 6th Edition, 2013 Stanley F. Malamed
- Killeys- Midface fractures vol I; Mandible fractures vol-II
- Medical Problems in Dentistry, by Scully & Cawson
- Minor Oral Surgery by Geoffery L. Howe

Reference Books

- Maxillofacial Surgery, 2nd edition, Booth, Schendel, Hausamen
- Operative Maxillofacial Surgery, 2nd edition, 2009. Langdon, Patel
- An Outline of Oral Surgery Part-I & Part-II by Killey, Sewarde & Kay
- Oral & Maxillofacial Surgery by Laskin
- Oral & Maxillofacial Surgery by Kruger
- Pain and Anxiety Control for the Conscious Dental Patient, Meechan JG, Robb ND, Seymour RA- Oxford University Press (1998)
- Color Atlas of Dental Analgesia and Sedation in Dentistry, Hill C M & Morris PJ
- Hand Book of Nitrous Oxide and Oxygen Sedation Clark MS & Burnick Al. Mosby (1999).
- Oral & Maxillofacial Surgery by John Peddler.
- Resuscitation handbook, Basket PKF (1989)

Annex: A

Learning Outcomes
Oral & Maxillofacial Surgery Final Year BDS

Sr.No	Theme/ Topics	Course Content	Learning Outcomes: Knowledge	Educational Strategy	Weightings	Assessment Tools
			At the completion of BDS Course, the students should be able to:			
I. Medically Compromised Patients & Medical Emergencies in Dental Clinic						
1.	**Medically Compromised States/ Emergencies**	Health Status Evaluation Medically compromised States Medical Emergencies	• List components of medical history of patient requiring dental surgery • Describe intra & extra-oral examination for oral & maxillofacial problems. • Enumerate major signs & symptoms of compromised status of the following: ➢ CVS ➢ Respiratory System ➢ Endocrinal System ➢ Hematological disorders ➢ Renal and hepatic disorders ➢ Gastro-intestinal system • CNS • List relevant investigations. • List essential drugs and equipment required for	• Interactive Lectures • Small Group Discussion • PBL / CBL	15 %	One Best MCQs & SAQs

			managing medical emergencies in dental clinics • Identify the special needs of females undergoing dental surgery while they: ➢ Are pregnant ➢ Are breast feeding • Identify the need of relevant medical referral(s) and consultation(s) • Administer basic life support in cases of medical emergencies • Identify and administer initial management of the following medical emergencies: ➢ Acute Anaphylaxis ➢ Vasovagal syncope ➢ Foreign body inhalation and aspiration ➢ Hypo / hypertension status ➢ Emergencies affecting any of the above mentioned systems			
			II. <u>Basic Surgical Principles</u>			
2.	**Basic Principles of Oral Surgery**	• Principles of aseptic and sterile surgical protocol.	• List steps of a minor oral surgery procedure. • Describe the principles of aseptic and sterile surgical protocol.	• Interactive Lectures • Small Group Discussions • PBL / CBL		• Type 1 MCQs • SAQs

		• principles of the following in oral surgery: ➢ Pre-op, intra-op and post-operative pain & anxiety control (select appropriate method – LA, LA + sedation, GA). ➢ Therapeutic and prophylactic use of antibiotics. ➢ Edema control. ➢ Hemostasis and dead space management. ➢ Management of medical emergencies. ➢ Access to facial skeleton. • Basic principles of flap design in oral surgery.	• Describe the principles of the following in oral surgery: ➢ Pre-op, intra-op and post-operative pain & anxiety control (select appropriate method – LA, LA + sedation, GA). ➢ Therapeutic and prophylactic use of antibiotics. ➢ Edema control. ➢ Hemostasis and dead space management. ➢ Management of medical emergencies. ➢ Access to facial skeleton. • Define these terms related to oral surgery flaps: height, base, apex, width, length, corners, sides, triangular, rectangular, sub marginal, semi-lunar • Describe basic principles of flap design in oral surgery. • Draw & label the following flaps used in minor oral surgery: ➢ 1, 2, 3 sided flaps and their variations. ➢ Sub-marginal / semi lunar. ➢ For tori removal.			

			➢ For impacted maxillary canines. ➢ 1st and 2nd stage implant surgery ➢ For impacted wisdom teeth. • name suture materials and needles used in oral surgery			
		Physiology of Wound Repair	• Describe the physiology of wound repair (soft tissues &bone) by: ➢ primary intention, ➢ secondary intention, ➢ Healing of an extraction wound and Osseo-integration. • Describe the factors that impair woundhealing. • Classify nerve injuries (Seddon & Sunderland). • Describe the principles of management of nerve injuries.			
		Medico-legal Documentation and Consent	• List the common areas of dental litigation. • List the steps to reduce risk of litigation. • Describe the role of a dentist in forensic odontology. • Recognize non-accidental injuries in children and adults			

			• Follow ethical standards in dentistry, research and on social media.			
III. Exodontia Including Local Anesthesia						
3.	**Exodontia**	Simple Exodontia	• Welcome, introduce; seat the patient. • Elicit relevant medical and dental history. • Set up the instrument tray. • Perform examination. • Order and interpret relevant investigations. • Record diagnosis (indications and contra-indications for extraction). • Enlist indications and contra-indications for the removal of teeth. • Formulate and finalize a treatment plan. • Name the nerves that need to be anesthetized to extract individual teeth.	• Interactive Lectures • Small Group Discussions • PBL / CBL	15 %	• Type 1 MCQs • SAQs
		Complicated Exodontia	• Enlist the indications for open extractions. • Select appropriate flaps for adequate access for complicated exodontia.			

			• Describe the technique used for open extraction of single and multi-rooted teeth. • Describe the procedure to remove fractured root fragments/tips. • State the justification for leaving root fragments in the socket. • Plan the sequence of multiple extractions.			
		Management of Impacted Teeth	• Define an impacted tooth. • Name commonly impacted teeth, and reasons for their impaction. • Enlist the indications for removal of impacted teeth. • Enlist the contraindications for removal of impacted teeth. • Classify impacted teeth & determine the level of difficulty for extraction. • Describe the management of a patient with an impacted third molar. • List and select appropriate treatment option for a patient with an impacted canine. • Describe the step-wise surgical procedure for the removal of impacted teeth.			

			• Take consent and enlist the potential risks and complications for the removal of impacted teeth.			
IV. Oral & Maxillofacial Infections						
4.	**Odontogenic & Non Odontogenic Infections**	• Factors (host, micro-organisms, anatomical) that govern the spread of odontogenic infections • Spread and pathophysiology of following infections in head and neck: ➢ Odontogenic infection to primary and secondary fascial spaces. ➢ Cavernous sinus thrombosis/orbital cellulitis. ➢ Mediastinitis ➢ Ludwig's angina. ➢ Osteomyelitis. ➢ Candidiasis, necrotizing	• Order and interpret relevant investigations. • Discuss factors (host, micro-organisms, anatomical) that govern the spread of odontogenic infections. • Diagnose and differentiate between edema (inoculation), cellulitis and abscess. • Describe spread and pathophysiology of following infections in head and neck: ➢ Odontogenic infection to primary and secondary fascial spaces. ➢ Cavernous sinus thrombosis/orbital cellulitis. ➢ Mediastinitis. ➢ Ludwig's angina. ➢ Osteomyelitis. ➢ Candidiasis, necrotizing fasciitis, actinomycosis. • Plan management for odontogenic infections:	• Interactive Lectures • Small Group Discussions • PBL / CBL	10 %	• Type 1 MCQs • SAQs

		fasciitis, actinomycosis. • Management of infections	➢ Remove the cause. ➢ Surgically drain pus and insert drains, if indicated. ➢ Provide supportive therapy: select appropriate antibiotic and manage airway, nutrition, and hydration. ➢ Refer, when indicated. • Choose and prescribe appropriate antibiotic(s) for odontogenic infections. ➢ Justify prophylaxis against infectious endocarditis and total joint replacement.			
V. <u>Oral & Maxillofacial Trauma</u>						
5.	**ATLS**	Advanced Trauma Life Support (ATLS) Principles	• List steps of ATLS evaluation (primary survey) of patient with maxillofacial trauma • Describe the detailed clinical examination of Maxillofacial trauma patients	• Interactive Lectures • Small Group Discussions • PBL / CBL	15%	• Type 1 MCQs • SAQs

6.	**Facial Soft Tissue Injuries and Dent alveolar Trauma**		• State etiology (name 3 causes) of maxillofacial trauma, Dentoalveolar trauma, facial soft and hard tissue injuries. • Define abrasion, contusion, laceration. • Order and interpret relevant investigations. • Describe the management of facial soft tissue injuries and close the intra-oral soft tissue wound by sutures in a logical order. • Classify traumatic injuries to the teeth and supporting structures (WHO Classification) • Splint teeth using acid etch technique or wires on a model. • Make an eyelet. • Do IMF on a model using eyelets and arch bars.	• Interactive Lectures • Small Group Discussions • PBL / CBL		• Type 1 MCQs • SAQs
7.	**Mandibular Fractures**		• Order and interpret relevant investigations. • Classify mandibular fractures according to the type, site and favorability to reduction.			

			• Formulate a treatment plan for mandibular fractures in adults and children. • Name possible complications of mandibular fractures.			
			• Order and interpret relevant investigations. • Classify mid and upper face fractures according to the type and site/level of fracture. • Discuss principles of management of midfacial fractures. • Describe management of patients with multiple facial injuries. • Discuss principles of management of fractures of zygomatic bone and arch, frontal bone and NOE complex. • Name complications of mid and upper face fractures. • Describe considerations in the management of pediatric and geriatric maxillo-facial trauma. • Describe principles of management of fire arm injuries involving the face. • Identify instruments used in management of OMF trauma.	• Interactive Lectures • Small Group Discussions • PBL / CBL		• Type 1 MCQs • SAQs

VI. Cysts, Tumors, Periapical, Antral and Other Pathological Lesions						
8.	Oral & maxillofacial pathology	Biopsy	• Order and interpret relevant investigations. • Describe the adjuncts to clinical screening of suspicious lesions, including fluorescent light and vital staining. • State the indications of biopsy and describe each type of soft and hard tissue biopsy. • Identify instruments used for oral biopsy. • Write a biopsy request form for histopathological examination and properly handle biopsy specimen.	• Interactive Lectures • Small Group Discussions • PBL / CBL	10 %	• Type 1 MCQs • SAQs
		Cysts	• classify jaw cysts (simple classification – odontogenic and non –odontogenic) • Differentiate between radicular, dentigerous and keratocyst. • State the indications, advantages, disadvantages and techniques for the management of jaw cysts and cyst-like lesions i.e. • Enucleation, marsupialization, enucleation followed by			

			marsupialization, enucleation with curettage.			
		Tumors	• Describe the management of jaw tumors based on the types ofresection: marginal (segmental), partial, total, composite. • Describe the management of benign soft tissue tumors. • Describe the management of potentially malignant (premalignant) lesions. • describe the management of malignant tumors of the oral cavity according to the following factors: • Histopathology, grade and extracapsular spread. • TNM staging.			
		Salivary Gland Disorders	• Describe pathophysiology and presentation of obstructive, retentive, infectious and neoplastic salivary gland disease. • Describe various diagnostic modalities for salivary gland disorders. • describe the principles of management of the following salivary gland disorders: sialolithiasis,	• Interactive Lectures • Small Group Discussions • PBL / CBL		• Type 1 MCQs • SAQs

			• Mucocele, ranula, infections, traumatic injuries to salivary glands, pleomorphic adenoma, Warthin's tumor, mucoepidermoid carcinoma, adenoid cystic carcinoma, adenocarcinoma.			
		Periapical & Periradicular Pathology	• Name the different endodontic surgical procedures • Order and interpret relevant investigations. • Discuss indications for surgical endodontic procedures. • List contraindications for surgical endodontics. • select appropriate procedure, flap, technique and (root-end filling) materials for surgical Endodontics • Discuss the post-operative instructions after endodontic surgery			
		Maxillary Sinus Diseases	• Describe odontogenic and non-odontogenic infections of maxillary sinus and their differential diagnoses. • Describe the treatment of sinusitis. • Classify oro-antral communication according to			

			size and describe their management according to the time elapsed. • Enlist the common maxillary sinus tumors of odontogenic and non-odontogenic origin and describe their management.			
		Management of patients undergoing Radiotherapy & Chemotherapy	• State the mechanism of action of radiotherapy, regimes of radiotherapy and list its adverse oral effects. • Describe the dental management of patients undergoing radiotherapy to the OMF region. • Define osteoradionecrosis. Describe its stages and management plan. • State the dental management of a patient undergoing systemic chemotherapy. • Define MRONJ. • State the management of a patient at risk of MRONJ needing dental extraction.			

VII. Dentofacial Deformity and Orthognathic Surgery						
9.	Oral & maxillofacial deformity	Dentofacial Deformity & Orthognathic Surgery	• Enlist causes of dentofacial deformities. • Order and interpret relevant investigations. • Describe the pre-surgical preparation for orthognathic surgery patient. • Describe the surgical treatment options (osteotomies) for the following: mandibular excess, mandibular deficiency, maxillary and mid-face deficiency, combination deformity, facial asymmetry. • Describe the role and advantages of distraction osteogenesis in OMF region	• Interactive Lectures • Small Group Discussions • PBL / CBL	10%	• Type 1 MCQs • SAQs
		Oro-facial Clefts	• Name the number of different types of rare facial clefts in addition to cleft lip and palate. • Classify cleft lip and palate for communication and record keeping. • Enlist the OMF problems faced by a cleft patient. • Constitute a team for the treatment of a cleft patient. • Describe the treatment of a cleft patient according to the			

			sequence and surgical procedures.			
		Reconstruction of OMF Defects	• State the general principles of OMF reconstruction. • Describe the biology of bone reconstruction and define osteo-induction, osteo-conduction, osteo- promotion and osteo-genesis. • Classify bone grafts on the basis of source and vascularity (autogenous) • Enlist the goals of mandibular reconstruction: restoration of continuity, alveolar bone height, osseous bulk and function. • Describe the role of maxillofacial prosthetics in rehabilitation of OMF defects.			
VIII. Prosthetics and Implants Surgery						
10.	**Preprosthetic and implant surgery**	Preprosthetic surgery	• Enlist objectives of pre-prosthetic surgery. • Identify abnormalities of soft and hard tissues which interfere with denture (partial/complete) construction and formulate a treatment plan.	• Interactive Lectures • Small Group Discussions • PBL / CBL	5 %	• Type 1 MCQs • SAQs

			• Name and describe ridge extension, augmentation and correction (osteotomies) procedures for mandible and maxilla. • Discuss complications of pre-prosthetic surgery. • Briefly describe the principles of following surgical procedures: ➢ Alveloloplasty simple, intraseptal (Dean's), ➢ tuberosity reduction, exostosis and undercuts correction, tori removal, ➢ mylohyoid ridge reduction, ➢ genial tubercle reduction, ➢ retromolar pad reduction, ➢ lateral palatal soft tissue excess removal, ➢ unsupported hypermobile tissue removal, ➢ inflammatory fibrous hyperplasia removal, ➢ Labial and lingual frenectomy • Describe the surgical protocol for immediate denture placement/construction.			

			• Describe methods of ridge preservation. • Describe procedure and advantages of overdenture.			
		Dental Implants Surgery	• Define dental implant and identify its components. • Define osseointegration, list factors influencing osseointegration. • Define the following terms related to dental implants: endosseous, root-form, cover screw, healing abutment/gingival former, single/two stage, screw/cement retained, biotypes. • Describe the following considerations for implant placement: soft tissue, hard tissue and biomechanical. • Assess a patient in need of dental implant(s) by history, clinical examination, and imaging. • Describe the surgical procedure for one stage, two stage and immediate dental implant placement. • State the peri-operative management of dental implant placement.			

			• Enlist complications of implant surgery and describe their management. • Describe ridge augmentation and preservation, guided bone regeneration, onlay bone grafting, sinus lift and distraction osteogenesis for dental implant placement. • Name the following special maxillofacial implants: zygomatic and extra-oral.			
IX. Pain / TMJ Surgery / Salivary Gland Diseases						
11.	**TMJ and facial pain disorders**	TMJ Disorders	• Classify TMJ disorders as: myofascial, internal derangement (Wilke's), systemic arthritis conditions, chronic recurrent dislocation, ankylosis, neoplasia and infections. • Select management options for TMD and ankylosis.	• Interactive Lectures • Small Group Discussions • PBL / CBL	5 %	• Type 1 MCQs • SAQs
		Oro-facial Pain	• Describe the pathophysiology of neuropathic pain. • Classify oro-facial pain according to site and etiology. • Differentiate trigeminal neuralgia from pre-trigeminal neuralgia, odontalgia, and post-herpetic neuralgia,			

			neuroma, burning mouth syndrome, glossopharyngeal neuralgia and headaches.			
X. Hospitalized patients & GA						
12.	**Management of hospitalized patients**	Pre and post-operative management of hospitalized patients	• Identify the need of patient hospitalization • Write consultation and referral requests to other specialties • Describe the pre and post-operative management of hospitalized patients • Advise the pre anesthesia investigations • Maintain operative and post-operative records of the hospitalized patients		5 %	

Clinical Outcomes: By the end of final year BDS, the students should be able to:

Health Status Evaluation

- Elicit detailed history of the patient
- Perform intra and extra-oral examination for oral and maxillofacial problems.
- Order and interpret relevant investigations.
- Apply the following suturing techniques: simple interrupted, figure of '8', horizontal and vertical mattress.
- Administer infiltration for maxillary extractions and mandibular anterior teeth extractions.
- Administer inferior alveolar nerve block for mandibular extractions.
- Administer supplemental LA techniques.
- Communicate with a patient after a complication has occurred (role play) + break bad news in a way to avoid litigation

Exodontia

- Use appropriate operator and patient positions,
- Identify and use appropriate instruments and techniques to perform an extraction
  - gingival detachment
  - forceps application
  - tooth luxation and delivery
  - jaw support and tissue retraction (non-dominant hand)
  - Advise postoperative instructions

Infections

- Order and interpret relevant investigations.
- Perform incision and drainage of intra oral abscesses
- Collect specimen for culture and sensitivity

Aids to dental specialties

- Order and interpret relevant investigations.
- Describe the surgical procedure for one stage, two stage and immediate dental implant placement.

Trauma

- Identify signs and symptoms of dento alveolar injuries
- Identify common signs and symptoms of facial fractures
- Order and interpret relevant investigations.
- Splint teeth using acid etch technique or wires on a model.
- Make an eyelet.
- Do IMF on a model using eyelets and arch bars.
- Order and interpret relevant investigations.
- Order and interpret relevant investigations.

Pathology

- Identify signs and symptoms of odontogenic cysts and tumors
- Identify clinical signs of oral malignancy
- Order and interpret relevant investigations.

Deformity

- Order and interpret relevant investigations.

Oro facial pain

- Differentiate odontogenic from non-odontogenic pain with history and clinical examination
- Diagnose trigeminal neuralgia and describe its management options.

CURRICULUM

FOR

PEDIATRIC DENTISTRY

(2024)

National University of Medical Sciences
Pakistan

1. Context / Preamble

Pediatric dentistry is an age defined discipline that provides preventive and therapeutic oral health care for infants and children through adolescence including those with special health care needs. Pediatric dentistry encompasses a variety of techniques, procedures and skills that share a common basis with other specialties but are modified and adapted to the unique requirements of infants, children and adolescents. Being an age-specific speciality,pediatric dentistry includes areas like behavior guidance, care of medically and developmentally compromised patients, supervision of orofacial growth and development, Aries prevention and treatment, dental treatment under sedation and general anesthesia. These skills are applied to the needs of children throughout their ever-changing stages of development. The concept of comprehensive care will be adapted so that students develop an awareness of and appreciation for the child.

2. **Mission:** The mission of this course is to train the BDS undergraduate students to provide primary preventive and restorative care to pediatric population that currently constitutes more than 40% of our country's population and whose oral/dental health needs have historically been neglected.
3. **Competencies:** The following generic competencies apply to this pediatric dentistry subject:
   - Critical appraisal
   - Comprehensive management
   - Communication ability with the children and parents
   - Professionalism
   - Manual dexterity
4. **Learning Outcomes:** Specific Learning outcome of each course is attached as Annex A.
5. **Implementation of the curriculum:**
6. ~~**Overview:**~~

   a. The pediatric dentistry is divided into three main blocks with allocation of 150 hours of teaching in an academic year.

1) PEDIATRIC DENTISTRY

INTRODUCTION

- **Philosophy of planning dental treatment in children**

RADIOLOGY

- **Principles of radiation safety and the specific considerations for pediatric patients**
- **Dental caries in children and adolescents**
- **Caries etiology, risk assessment, preventive strategies, restorative options**

Prevention of dental diseases in children

- **Oral hygiene measures, fluoride therapy, dietary counselling, sealants, oral health education, safety and toxicity of fluorides**

Psychological and pharmacological management of children's behavior

- **Behavior guidance techniques,**
- **communication skills,**
- **pharmacological and non-pharmacological options for anxiety and pain management**

Restorative dentistry for primary teeth

- **Anatomic differences between primary and permanent dentition,**
- **Materials and techniques for primary tooth restorations,**
- **Sealants and conservative adhesive restorations.**

Pulp therapy in primary and young permanent teeth

- **Diagnosis and treatment of pulp conditions in primary and young permanent teeth,**
- **Pulpotomy, Pulpectomy, Apexification and Apexogenesis.**
- **Follow up and recall.**

Space management and space maintainers

- **Evaluation of space needs,**
- **Space maintenance options,**
- **Management of early tooth loss**

Anomalies of developing dentition

- **Developmental disturbances,**
- **genetic and systemic conditions affecting tooth development.**
- **anomalies of tooth size, number and form.**
- **Enamel defects, dentin defects, anomalies of cementum**

Dental trauma to primary and young permanent teeth

- **Diagnosis, emergency management, and treatment of dental trauma in children.**
- **sequelae of trauma to primary and permanent dentition**

Nitrous oxide-oxygen inhalation sedation

- **Indications, administration, monitoring, and management of nitrous oxide-oxygen sedation in children**

Space management and space maintainers

- **Evaluation of space needs,**
- **Space maintenance options,**
- **Management of early tooth loss**

Dental management of special children

- **Treatment considerations for children with special healthcare needs,**

- **Behavior management, modifications in dental care**

Hospital Dentistry

- **Introduction to hospital dentistry.**
- **Patients requiring hospital dentistry, description of procedures for admissions, investigations, clinical notes, medications and discharge.**
- **Protocols of operation theatre.**

- The theory component is covered by one lecture per week in fourth (Final) year.
- Implementation of curriculum is at the discretion of institute. Clerkships/ clinicalrotations for 08 weeks' may be followed.
- During their clinical rotation, students in small groups learn through practical chairside demonstrations of the techniques of
    a. local anesthesia administration
    b. perform cavity preparation, condensation, burnishing and finishing of restorations.
    c. Perform pediatric extractions
    d. Observe pulpotomy and pulpectomy procedures.

7. Resources:

- **Infrastructure resources:**

1. Phantom Lab
2. Clinical Department
3. Lecture Halls
4. Conference Room

- **Human resources:**

1. Assistant Professor
2. Demonstrators

8. Facilities:

To be filled by each Institute

9. Course Administration:

- Didactic
- Clinical
    1. Clinical Demonstrations.
    2. Small group discussions.
    3. Phantom lab.
    4. Extracted teeth.
    5. Practice on patients.

10. Students Assessment:

a. Minimum attendance of 75% is a requirement to appear in university professionalexamination.
b. Students are expected to perform 100 fillings of teeth as recommended by PM&DC duringtheir clinical duty in 4th Year BDS and successfully complete practical exercises and assignments.
c. Continuous formative evaluation is conducted during the academic year comprising of 5 theory tests, and 2 clinical assessment tests (Pre-annual and Annual). The results are communicated to students through notice board. Feedback is provided after each evaluation.
b. The weighting of internal assessment is 20% in 4th professional BDS Examination
c. There will be two mid-term & term examinations followed by a pre-Annual and annualexaminations each year.
d. The structure of the paper of all the term examinations and pre-annual will be the same as thatfor annual examination though syllabus will be different.
e. The structure of Mid-term exam will be half of the term exam.
f. The syllabus for mid-term & term examinations will be announced by the department at least 02weeks prior to examination.
g. Pre-annual examination will be from whole syllabus.
h. The date sheet for mid-term, term and pre-annual examinations will be published by Examination branch while the examinations will be conducted by respective department. The result will be submitted to examination branch for incorporation in internal assessment.
i. The University shall take the 4th professional Examination at the end of the academic year. AnnualTheory will be of 100 marks & Practical Examination will be of 100 marks. The pass score shall be50% in theory and practical separately. However, in clinical subjects, student should pass in clinical exams / OSCE (with 50% marks) and unobserved stations (with 50% marks) separately.
j. **Logbook**

Each student is expected to maintain record of practical work in logbook. Safe keeping (make copies) of the logbook is the responsibility of each student. The logbook must besubmitted to the pediatric dentistry department at the end of the academic year.

11. Communication of Information to Students: All

information communicated tostudents through Notice, messages, websites ,multimedia forum and learning platforms.

12. Learning Resources

Recommended Textbooks

- Paediatric dentistry infancy through Adolescence
  By: Paul S Casamasimo Henry W.fields Dennis j. McTigue, Arthur Nowak
  5th edition Sanders 2013
- Dentistry for the child and Adolescent
  By Ralph E MacDonald
  9th edition must be Mosby.Co 2011
- Paediatric Dentistry
  By Richard Welbury ,Monty S Duggal and Marie Therese Hosey
  5th edition Oxford University Press 2018

Additional References:

The American academy of pediatric dentistry guidelines

Annexure A

TOPIC	Course Content	Learning Outcomes At the end of each module, student will be able to:		
		Knowledge	Skills	
INTRODUCTION	• Philosophy of planning dental treatment in children	• Explain the principles and objectives of planning dental treatment specifically tailored for children. • Recognize the influence of child behavior on treatment planning decisions. •	• Develop individualized treatment plans for pediatric patients. • Provide clear instructions on post-treatment care and preventive measures to parents	L le
RADIOLOGY	• Principles of radiation safety and the specific considerations for pediatric patients	• Explain the potential risks and benefits of dental radiographs in children. • Differentiate between normal variations and abnormal findings in dental radiographs of children. •	• Demonstrate proper positioning and exposure techniques to obtain high-quality pediatric dental radiographs. • Identify and correct common errors in radiographic positioning to improve image quality.	L le

Dental caries in children and adolescents	• Caries aetiology, risk assessment, preventive strategies, restorative options	• Etiology and Pathogenesis of Dental Caries • Explain the microbial and dietary factors that contribute to caries initiation and progression in children • Describe evidence-based preventive measures, such as fluoride therapy and sealants, to minimize caries incidence in children • Apply appropriate diagnostic tools, such as visual-tactile examination and radiographic interpretation	• Perform minimally invasive restorative procedures, such as dental fillings and stainless steel crowns, in children • Apply non-surgical caries management techniques, • Management of ECC	L le
Prevention of dental diseases in children	• Oral hygiene measures, fluoride therapy, dietary counselling, sealants, oral health education, safety and toxicity of fluorides	• Describe the unique oral health needs and challenges specific to children at different stages of growth and development. • Describe the long-term benefits of early preventive interventions on oral health throughout a child's life	• Fluoride application and silver diamine fluoride (SDF) treatment. • Instruct children and parents on the correct usage of preventive products, such as fluoride toothpaste and mouth rinses. • Application of pits and fissure sealents	L le

Psychological and pharmacological management of children's behaviour	• Behaviour guidance techniques, communication skills, pharmacological and non pharmacological options for anxiety and pain management	• Describe the typical behavioral patterns and emotional responses of children at different developmental stages • Identify and apply behavior management strategies specific to pediatric dental care, such as positive reinforcement and tell-show-do techniques.	• Address children's concerns and questions in a compassionate and reassuring manner • Apply a range of behavior management techniques to help children cope with dental procedures	L le
Restorative dentistry for primary teeth	Anatomic differences between primary and permanent dentition, Materials and techniques for primary tooth restorations, Sealants and conservative adhesive restorations.	• Understand the morphology and characteristics of primary teeth. • Learn various cavity preparation techniques suitable for primary teeth and how to place restorative materials like dental composites or glass ionomer cements to restore the teeth.	• Demonstrate proficiency in cavity preparation techniques appropriate for primary teeth, considering their size, morphology, and pulp proximity. • Educate parents or guardians about the importance of primary tooth restorations and sealants	L le

Pulp therapy in primary and young permanent teeth	Diagnosis and treatment of pulp conditions in primary and young permanent teeth, pulpotomy, pulpectomy, apexification and apexogenesis. Follow up and recall.	• Identify clinical and radiographic signs of pulp involvement, including pulp exposure, pulpitis, and periapical pathology. • Learn the indications and contraindications for pulpotomy and pulpectomy in primary teeth with reversible pulpitis. • Understand the different techniques and materials used for pulpotomy and pulpectomy • Learn the apexification technique, • Understand apexogenesis	• Perform a comprehensive and accurate clinical examination of primary and young permanent teeth. • Apply appropriate diagnostic tests, such as pulp vitality tests, percussion tests, and thermal sensitivity tests. • Plan and schedule appropriate follow-up and recall appointments to monitor the healing and long-term success of pulp therapy.	L le

Space management and space maintainers	Evaluation of space needs, space maintenance options, management of early tooth loss	• Define space maintainers and explain their role in pediatric dentistry. • Describe the types and classifications of space maintainers used for different clinical scenarios. • Identify the indications and contraindications for space maintainer placement. • Implement evidence-based approaches to space management in real-world clinical scenarios.	• Perform a comprehensive oral examination to identify the need for space maintainers • Assess the space requirements and select the appropriate type of space maintainer	L le

Anomalies of developing dentition	Developmental disturbances, genetic and systemic conditions affecting tooth development, anomalies of tooth size, number and form. Enamel defects, dentin defects, anomalies of cementum	• Define developmental disturbances and dental anomalies affecting tooth development, including anomalies of tooth size, number, and form. • Identify the various genetic and systemic conditions that can impact tooth development. • Analyze the different treatment approaches and management options for patients with developmental disturbances	• Utilize radiographic imaging to aid in the diagnosis and evaluation of dental anomalies. • Differentiate between dental anomalies and normal variations in tooth development. • Formulate an appropriate treatment plan based on the severity and impact of dental anomalies on oral health.	L le

Dental trauma to primary and young permanent teeth	Diagnosis, emergency management, and treatment of dental trauma in children. sequelae of trauma to primary and permanent dentition	• Describe the etiology, prevalence and classification of dental trauma in children and its impact on primary and permanent dentition. • Perform a thorough clinical examination and radiographic assessment to accurately diagnose. • Develop an appropriate treatment plan for dental trauma. • complications arising from dental trauma, such as pulp necrosis, root resorption, and periodontal sequelae,	• Students will be able to recognize and differentiate between different types of dental trauma in clinical scenarios and radiographs. • Students will be able to evaluate and apply appropriate treatment.	L le
Nitrous oxide-oxygen inhalation sedation	Indications, administration, monitoring, and management of nitrous oxide-oxygen sedation in children	• Describe the indications and contraindications for nitrous oxide-oxygen sedation in pediatric patients. • Demonstrate knowledge of the equipment and materials required for nitrous oxide-oxygen sedation.	• Students will be able to identify appropriate clinical situations in which nitrous oxide-oxygen sedation is indicated for managing anxiety and pain in children during dental procedures	L le

Dental management of special children	Treatment considerations for children with special healthcare needs, behaviour management, modifications in dental care	• Understand the diverse medical, developmental, and psychological conditions that may classify a child as having special healthcare needs. • Describe the importance of multidisciplinary collaboration in the dental care of children with special healthcare needs.	• Students will be able to identify and differentiate various medical and developmental conditions in children that may require special consideration.
Hospital Dentistry	Introduction to hospital dentistry. Patients requiring hospital dentistry, description of procedures for admissions, investigations, clinical notes, medications and discharge. Protocols of operation theatre.	• Describe the procedures and protocols for admitting patients for hospital dentistry. • Explain the investigations required before initiating dental treatment in a hospital setting, including medical history, laboratory tests, and radiographic examinations. Describe the process of discharging patients after hospital-based dental treatment, including post-operative care	• Students will be able to conduct a comprehensive assessment, order appropriate investigations, and interpret the results to ensure safe and effective dental care.

		instructions and follow-up plan		