



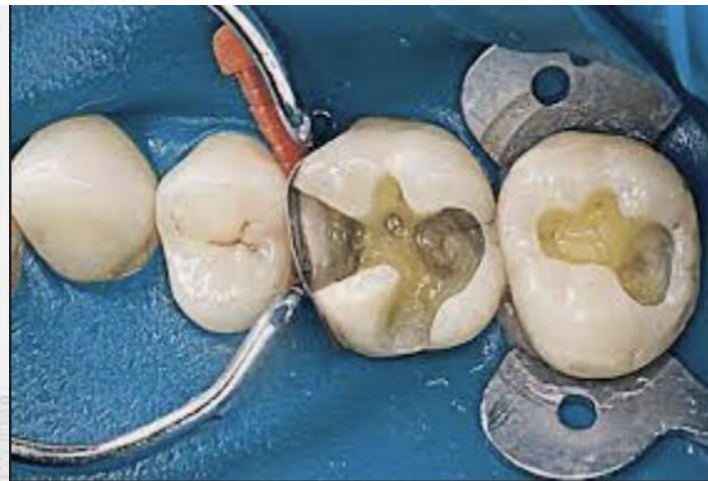
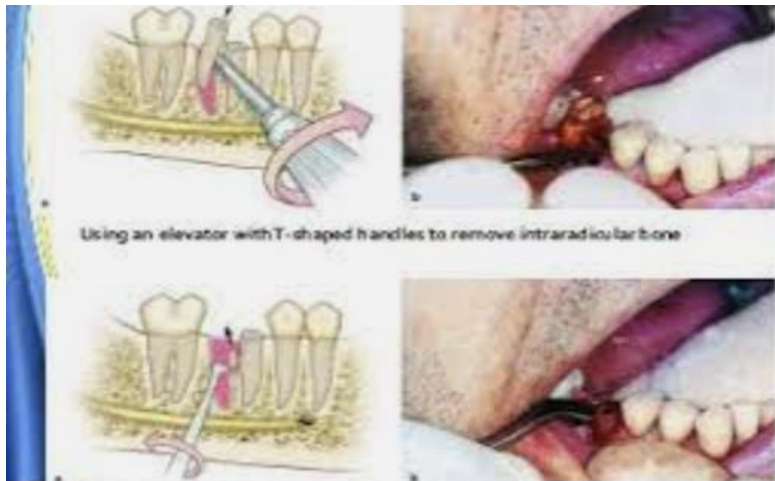
DENTAL COLLEGE HITEC-IMS

Study Guide Y4 - T2 - D24

Term 2

Final Year BDS

Coordinator: Prof. Dr. Beenish Qureshi





“Medical education does not exist to provide students with a way of making a living but to ensure the health of the community.”

Rudolf Virchow



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List of Abbreviations

CBL	Case Base Learning
EECS	Early Exposure to Clinical Skills
EOT	End of Term Examination
FGD	Focus Group Discussion
LGIF	Large Group Instructional Format
LGIS	Large Group Interactive Session
MCQ	Multiple Choice Question
MIT	Mode of Information Transfer
NUMS	National University of Medical Sciences
OMFS	Oral & Maxillofacial Surgery
OSCE	Objectively Structured Clinical Examination
OSPE	Objectively Structured Practical Examination
PMC	Pakistan Medical Commission
SAQ	Short Answer Question
SDL	Self-Directed Learning
SEQ	Structured Essay Questions
SGD	Small Group Discussion
TOS	Table of Specification
WFME	World Federation of Medical Education

NUMS Vision

The vision of the National University of Medical Sciences is to improve the quality of life through education, research, innovation, and healthcare, thereby contributing to endeavors to make Pakistan and this world a better place to live in.

Institutional Vision

Leading advancement in Oral & Dental health through excellence
In education, patient care and research

Institutional Mission

To serve the local and global communities by producing competent, ethical, socially responsible, research oriented and lifelong learning oral health care professionals



Term Committee

Coordinator: Professor Dr. Beenish Qureshi

HoD Operative Dentistry, Contact No: 0333-4368332

S. No.	Name	Designation	Departments	Contact Number
1.	Prof. Dr. Waheed Ullah Khan	Vice Principal / Professor / Dean Clinical Sciences / HoD	Orthodontics	0333-5206136
2.	Prof. Dr. Beenish Qureshi	Professor / HoD	Operative Dentistry	0333-4368332
3.	Dr. Aamir Rafique	Associate Professor / HoD	Prosthodontics	0334-4353578
4.	Dr Amna Riaz	Assistant Professor / HoD	Pediatric Dentistry	0336-5775566
5.	Dr. Maimoona Siddique	Assistant Professor / HoD	OMFS	0333-2173509
6.	Dr. Faizan Munir	Assistant Professor / HoD Dental Education	Dental Education	0334-0031031
7.	Huda habib	Student	Final Year	0343-1713550
8.	Umer Farooq	Student	Final Year	0344-6102536



Curriculum Overview/Implementation

1. Preface

The curriculum meets the standards of the Pakistan Medical Commission, the Higher Education Commission of Pakistan, and the World Federation of Medical Education, so that our students, on completion of the program, have the required competencies as defined worldwide in a graduate doctor.

2. Model

The curriculum of Dental College HITEC-IMS is based on a traditional discipline-based model of educational strategies. Nevertheless, we have incorporated some elements of SPICES model student-centred, integrated, community-oriented and systematic aspects. As a result, our curriculum has evolved, considering traditional, experiential, behavioural, and constructivist perspectives of curricula.

3. Organisation

The curriculum is organised and integrated along important vertical and horizontal dimensions. The content taught is integrated concurrently in the horizontal organisation and vertically across the years of BDS program. The course of the final year is divided into three terms. In each term, the sequencing of the content is logical and integrated. Research methodology and professionalism will be inculcated as part of the longitudinal theme.



4. Teaching Strategies

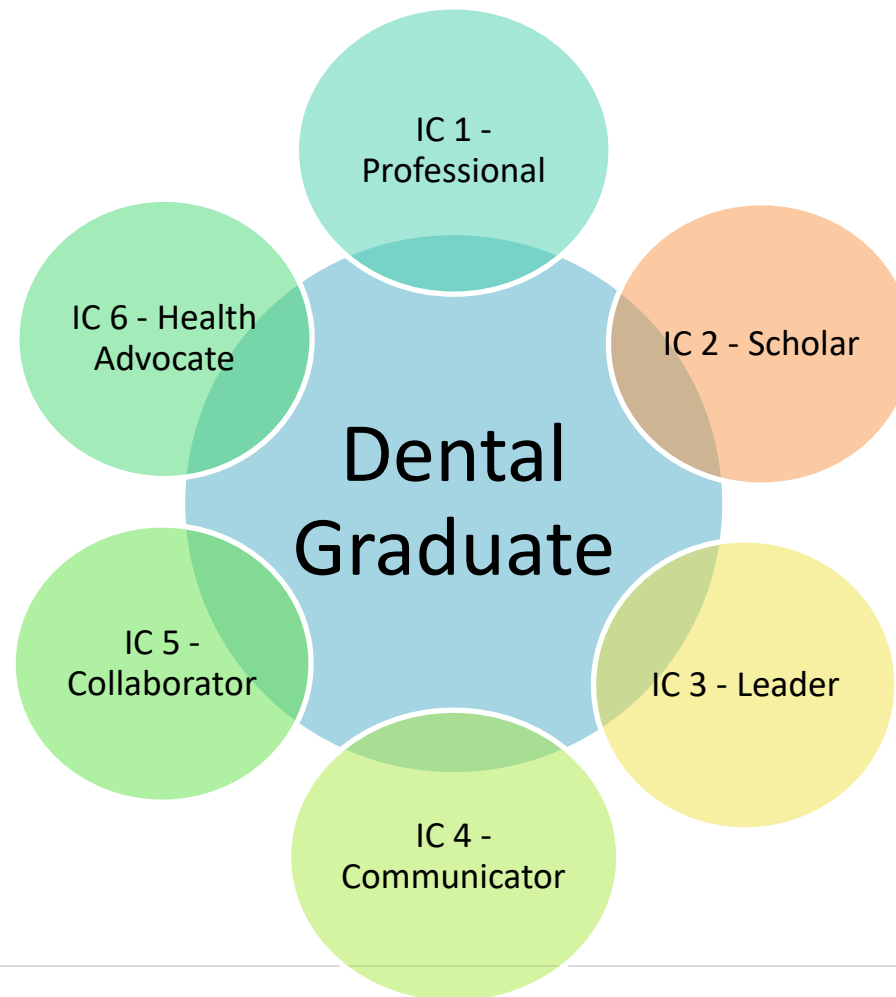
This curriculum aims to improve doctors' clinical skills, including communication, leadership, management, research skills, ethical values and professionalism. BDS final year deals with the clinical subjects of Operative Dentistry, Orthodontics, Prosthodontics and Oral & Maxillofacial Surgery to learn and develop clinical skills. In addition, clinical exposure is ensured, which helps them learn real-life clinical scenarios and implement the skills learnt during the academic session.

Multiple teaching strategies are used. First, LGIS are used to provoke thought and understanding among students. These help to understand topics which need effort including basic sciences review along with updated research, and best evidence medical information. Second, we are teaching clinical implications of each topic giving learning experience that is contextual, realistic, and relevant. Third, small group discussions encourage students to learn socially and discuss their concepts to refine their schemas.

5. Assessment

Constructive feedback is provided via formative assessments by assignments, presentation, CBL and class tests. The students are summatively assessed by term and pre annual examinations at the end of the academic year according to the standards outlined by NUMS.

Institutional Competency Framework



Alignment of Term Outcomes with Institutional Competencies

S. No.	Term Outcomes	Term Outcome Code	Institutional Competencies
1.	Correlate aetiology of dento-alveolar trauma with application of knowledge, interception & long-term management in relevant clinical conditions	Y4-T2/O-1	IC 1 to IC 6
2.	Apply the concepts of occlusion to recognize the need for appropriate treatment plan with its application using principles of biomechanics and its implementation for space management	Y4-T2/O-2	IC 1 to IC 6
3.	Correlate the clinical presentation of dentate & edentulous patients with application of principles of endodontics and prosthetic management	Y4-T2/O-3	IC 1 to IC 6
4.	Recognize the importance of oral & perioral structures and apply the knowledge to investigate & surgically treat different oral pathologies	Y4-T2/O-4	IC 1 to IC 6



Yearly Clinical Rotation Schedule

Yearly Clinical Rotation Schedule
FINAL YEAR BDS SESSION 2024

1ST ROTATION PLAN

DURATION	18 th December – 19 th May (20 weeks) ---- 5 weeks in 4 major Departments			
DEPARTMENT	Operative Dentistry	Prosthodontics	Orthodontics	OMFS
18-12-23 to 21-01-23	A	B	C	D
22-01-24 to 25-02-24	D	A	B	C
26-02-24 to 03-03-24	C	D	A	B
04-03-24 to 10-03-24	Sports Week			
11-03-24 to 07-04-24	C	D	A	B
08-04-24 to 14-04-24	Eid-ul-Fitr Holidays			
15-04-24 to 19-05-24	B	C	D	A

Group: A = Roll no. : 100 - 112

Group: B = Roll no. : 113 - 126

Group: C = Roll no. : 127 - 140

Group: D = Roll no. : 141 - 149, 049, 064 & 090



2ND ROTATION PLAN

DURATION	20 th May – 20 th October (20 weeks each) ---- 4 weeks in each Department				
DEPARTMENT	Operative Dentistry	Prosthodontics	Orthodontics	OMFS	Paedodontics
20-05-24 to 16-06-24	A	B	C	D	E
17-06-24 to 30-06-24	Summer Vacations + Eid ul Adha Holidays				
01-07-24 to 28-07-24	E	A	B	C	D
29-07-24 to 25-08-24	D	E	A	B	C
26-08-24 to 22-09-24	C	D	E	A	B
23-09-24 to 20-10-24	B	C	D	E	A

Group: A = Roll no. : 100 - 109

Group: B = Roll no. : 110 - 119

Group: C = Roll no. : 120 - 130

Group: D = Roll no. : 131 - 141

Group: E = Roll no. : 142 - 149, 049, 064 & 090

Assessment

Types and Schedules



Assessment is continuous in the form of class tests, departmental assignments and practical tests. Continuous assessment is separate from the Term exam.

Formative assessment includes tests/written assignments, presentations and feedback to the student during the teaching time. The purpose of formative assessment is to provide feedback to the students for improvement and to teachers to identify areas where students need further guidance.

From the 4th week onwards, the class tests of Operative Dentistry, Prosthodontics, Orthodontics, and OMFS will be held on rotation basis. During the 12th week, the end-of-term exam will be taken. The EOT exam will comprise of theory and practical separately. All these will form part of summative assessment, along with pre-annual exams. This will contribute towards internal assessment.

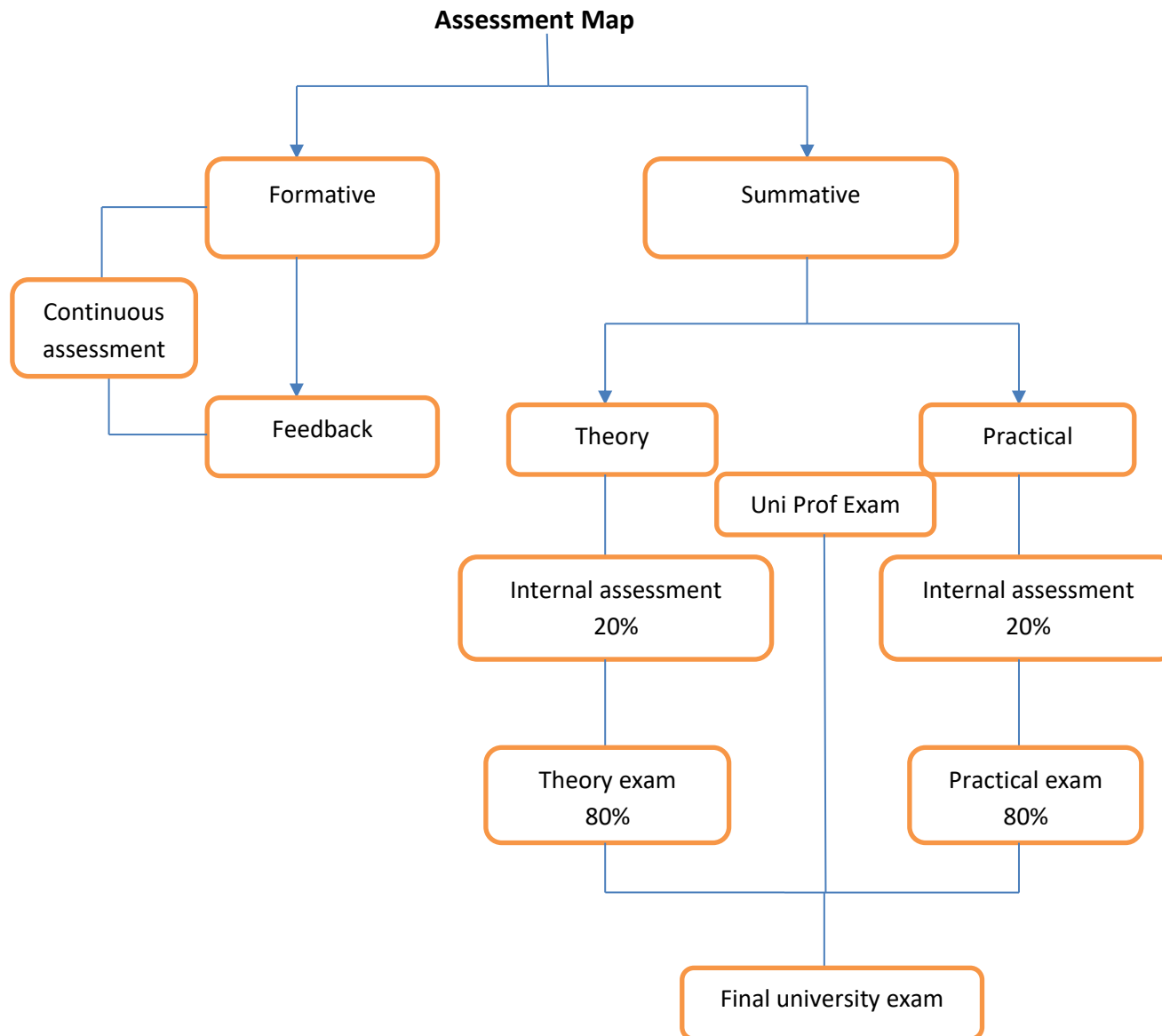
Students must secure 50% marks in theory and practical exams separately, per university criteria.

The student who fails the end-of-term exam will be allowed to attend the next term; however, his/ her internal assessment will be affected accordingly.

Internal assessment criteria for submission of internal assessment marks of final Professional Examination NUMS:


1. The weightage of internal assessment shall be 10% or ten marks for a 100 marks Paper in the annual examination.
2. End-of-term examination / practical quota, pre-annual examination and accumulative attendance shall contribute toward internal assessment.

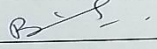
Standard Assessment Map



Academic Calendar

Final Year BDS Session – 2023/24

 Academic Calendar Final Year BDS Session – 2023/24		Duration: 40 weeks
Academic Event	Duration	
Commencement of New Academic Year	18 th December 2023	
Orientation day	20 th December 2023	
FIRST TERM (12 Weeks)		
Academics 10/12 Weeks	18 th December 2023 to 25 th Feb 2024	
Sports Week	26 th Feb 2024 to 4 th March 2024	
Academics 02/12 Weeks	04 th March 2024 to 17 th March 2024	
1 st Term exam	11 th March 2024 to 15 th March 2024	
SECOND TERM (14 Weeks)		
Academics 3/14 Weeks	18 th March 2024 to 07 th April 2024	
Eid ul Fitr Holidays (1 Week)	08 th April 2024 to 14 th April 2024	
Academics 09/14 Weeks	15 th April 2024 to 16 th June 2024	
Summer Vacations + Eid ul Adha (2 Week)	17 th June 2024 to 30 th June 2024	
Academics 2 nd /14 Weeks	1 st July 2024 to 14 th July 2024	
2 nd Term Exam	8 th July 2024 to 14 th July 2024	
THIRD TERM (14 Weeks)		
Academics 14/14 Weeks	15 th July 2024 to 20 th October 2024	
Prep Leaves (1 Week)	21 th October to 27 th October 2024	
Send up / Pre Prof Exam (2 Weeks)	28 th October 2024 to 10 th November 2024	
Prep Leaves for Prof (05 Weeks)	11 th November 2024 to 15 th December 2024	
Final Professional Exam	16 th December 2024 As proposed by NUMS	


 Coordinator Final Year BD:

CC: Principal Dental College HITEC-IMS
 Admn & Ops
 All HOD's of Final Year BDS
 Student Affairs Department
 Department of Dental Education



Time Table

DENTAL COLLEGE HITEC – INSTITUTE OF MEDICAL SCIENCES						
RECORD FORMAT						
WEEKLY TIME TABLE						
Final year BDS (2023-2024)						
Weekly Time Table (15 th April 2024 to 21 st April 2024) (Week-16)						
DAY/DATE	8:30 - 9:15	9:15 – 10:00	-	10:00 -10:20	10:20 – 03:30	
MONDAY 15-04-24	<u>Prosthodontics(LGIS)</u> Selection of teeth (Dr Sameen)	<u>Operative Dentistry(LGIS)</u> Intra canal medicaments (Prof Dr Beenish)	-	Break	CLINICS <u>GROUP-B (Operative Dentistry)</u> (Demonstration) Introduction to dept.(Chair positioning & Hist Clinical Quota (Dr Beenish + Dr Sharaz +Dr Usman) <u>GROUP-C (Prosthodontics)</u> (Demonstration) History + Examination Clinical Quota.(Dr Aamir + Dr Sameen + Dr Muqheet) <u>GROUP-D (Orthodontics)</u> (Demonstration) History taking C/E Clinical Quotas (Dr Aymen) <u>GROUP-A (OMFS)</u> (Demonstration) Orientation to OMFS department. Clinical Quotas. (Dr Maimoona+ Dr Fatima+ Dr Sadia &Dr Hassan)	
TUESDAY 16-04-24	<u>Orthodontics(LGIS)</u> Biomechanics (Dr Hasnain)	<u>OMFS(LGIS)</u> Pathology (Dr Maimoona)	-	-	10:20-2:00 Clinics	
WEDNESDAY 17-04-24	<u>Peadodontics (LGIS)</u> Pulp therapy in young permanent teeth (Dr Amna)	<u>Prosthodontics(LGIS)</u> Occlusion of complete denture (Dr Sameen)	-	-	2:00-3:30 CBL	
THURSDAY 18-04-24	<u>OMFS (LGIS)</u> Infection (Dr Fatima Khattak)	<u>Orthodontics(LGIS)</u> Biomechanics (Dr Hasnanin)	-	-		
FRIDAY 19-04-24	<u>Operative Dentistry(LGIS)</u> Obturation (Prof Dr Beenish)	<u>Peadodontics (LGIS)</u> Pulp therapy in young permanent teeth (Dr Amna)	10:00-10:45 (Ortho) Anchorage (Dr Husnain)	10:45-12:00 <u>Clinics</u>	12:00- 03:30 (SDL + Jumma Break) (Op) Irrigation system (Prosth) Articulators (Ortho) Reinforced anchorage (OMFS) Dental chair positioning	
<p>Group: A = Roll #100 – 112; Group: B = Roll # 113 -126; Group: C = Roll # 127 -140; Group: D = Roll # 141-149-049-064 & 090</p>						
Prof. Dr. Beenish Qureshi <i>(Signature)</i>		Prof. Dr. Waheed Ullah <i>(Signature)</i>		Dr. Aamir Rafique <i>(Signature)</i>		Dr. Maimoona Siddique <i>(Signature)</i>
Dr. Faizan Munir <i>(Signature)</i>		Vice Principal <i>(Signature)</i>		Principal <i>(Signature)</i>		Dr Amna Riaz <i>(Signature)</i>
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Term – II

Practice Based Learning



Structured Summary – Term II

Term Code	Y4-T2-D24
Term Title	Practice Based Learning
Duration Of Term	14 weeks
Important Dates	18 th March 2024 – 14 th July 2024
Horizontally Integrated Themes	<ol style="list-style-type: none"> 1. Dental traumatology 2. Surgical Endodontics 3. Space Management
Vertically Integrated Themes	Research Methodology Communication Skills* Professionalism*
Prerequisite Blocks	First Term Final Year

*These themes are taught via MITs of clinical rotations, SGD's, CBL's and role modelling in clinical years via practical and role playing in basic sciences



Tentative Exam Schedule¹
Final Year BDS – 2nd term -2024

Theory exam schedule:

DATE/DAY	SUBJECT	TIME
08-07-24 / Monday	Operative Dentistry	8:30am to 11-30am
10-07-24 /Wednesday	Orthodontics	8:30am to 11-30am
11-07-24 / Thursday	OMFS	8:30am to 11-30am
12-07-24 / Friday	Peads	8:30am to 11-30am
12-07-24 / Monday	Prosthodontics	8:30am to 11-30am

Practical exam schedule:

The exit exam at the end of each rotation from each department will be counted as practical exam of second term.

¹ This is a tentative schedule. Therefore, it is subject to change.

Learning Outcomes for Term II

1. Operative Dentistry

S. No.	Topic	Learning Outcomes	Learning Objectives	IC CODES	MIT	Assessment Tool
1.	Introduction to Endodontics	At the end of session, student will be able to: <ul style="list-style-type: none"> Demonstrate the scope & rationale of endodontic treatment 	At the end of lecture, student will be able to: <p>Knowledge</p> <ul style="list-style-type: none"> Define Endodontics Describe Scope of endodontics Define rationale for treatment Describe objective of endodontic treatment 	IC 2	LGIS	MCQs/Viva
2.	Tooth morphology & access cavity preparation	<ul style="list-style-type: none"> Execute all the stages of endodontic treatment using conventional and contemporary techniques Appropriately seal and protect root canal treated teeth before discharge of the patient Implement suitable recall schedules and plan further therapy when required 	<p>Knowledge</p> <ul style="list-style-type: none"> Define objectives of access opening Describe working length determination 	IC2	LGIS	MCQs/SEQs/Viva
			<p>Skill</p> <ul style="list-style-type: none"> Use of rubber dam isolation Endodontic access preparation and length determination on extracted teeth and on patients 	IC 1 to IC 6	Demonstration Practical	OSCE
			<p>Attitude</p> <ul style="list-style-type: none"> Explain procedure to the patient Avoid iatrogenic damage during endodontic access 	IC 1 to IC 6	Demonstration	OSCE

3.	Preparation of radicular pulp space irrigants & antiseptics intracanal medicaments	<ul style="list-style-type: none"> Describe the role, properties and techniques for irrigation 	<p>Knowledge</p> <ul style="list-style-type: none"> Describe the rationale for chemo-mechanical preparation of canals Define cleaning and shaping techniques Describe Irrigants Define the role of intra canal medicaments 	IC 2	LGIS / SGD / CBL	MCQs/SEQs
			<p>Skill</p> <ul style="list-style-type: none"> Use different temporary restorations Perform cleaning and shaping of extracted teeth and then on patients 	IC 1 to IC 6	Demonstration Practical	OSCE
			<p>Attitude</p> <ul style="list-style-type: none"> Follow a careful approach to avoid procedural accidents 	IC 1	Demonstration	OSCE
4.	Obturation	<ul style="list-style-type: none"> Discuss the objectives and techniques of obturation Perform obturation on patient 	<p>Knowledge</p> <ul style="list-style-type: none"> Describe the objectives of obturation Identify when to obturate the canal Enumerate the obturation techniques Enlist the ideal properties of obturating materials and sealers 	IC 2	LGIS / SGD / CBL	MCQs/SEQs/Viva

			<p>Skill</p> <ul style="list-style-type: none"> Perform obturation on extracted teeth and on patients 	<p>IC 1 IC 3 IC 4 IC 5 IC 6</p>	<p>Demonstration Practical</p>	<p>OSCE</p>
			<p>Attitude</p> <ul style="list-style-type: none"> Treat all patients with dignity and respect 	<p>IC 1 IC 6</p>	<p>Demonstration Practical</p>	<p>OSCE</p>
5.	Root Fractures	<ul style="list-style-type: none"> Describe and Discuss different types of root fractures 	<p>Knowledge</p> <ul style="list-style-type: none"> Classify and explain different tooth fractures , fractured cusp. cracked tooth, vertical root fracture Explain differential diagnosis of different type of fractures. <p>Skill Diagnose & counsel patients for management of craze lines fractured cusp & vertical root fractures.</p> <ul style="list-style-type: none"> 			
6.	Endodontic Emergencies	<ul style="list-style-type: none"> 	<p>Knowledge</p> <ul style="list-style-type: none"> Define & Categorize different endodontic emergencies Enlist diagnosis & treatment plan for endodontic emergencies 			

			<ul style="list-style-type: none"> • Discuss Pre treatment enter appointment & post obturation emergencies • 			
7.	Root Resorption	<ul style="list-style-type: none"> • Differentiate & Manage external & internal root resorption 	<p><u>Skill</u> Demonstrate a sequential approach for prevention & management of Endodontic Emergencies.</p> <ul style="list-style-type: none"> • 			
			<p><u>Knowledge</u></p> <ul style="list-style-type: none"> • Diagnose internal & external resorption on basis of clinical and radiographic findings • 	IC 2 IC 6	LGIS	MCQs/SEQ/Viva
			<p><u>Skill</u> Diagnose resorption on basis of radiographic reputation</p> <ul style="list-style-type: none"> • 			
8.	Surgical Endodontics Traumatic Dental Injuries	2. Discuss surgical endodontic treatment modalities	<p><u>Knowledge</u></p> <ul style="list-style-type: none"> • Define endodontic surgery 	IC 2 IC 6	LGIS	MCQs/SEQ/Viva

		<ul style="list-style-type: none"> Evaluate and manage dental trauma Communicate effectively with medical and dental specialists to safeguard patient safety and ensure continuity of care Explain the need for clear and effective communication with patients and their parents/guardians where children are involved 	<ul style="list-style-type: none"> Enlist different surgical endodontic treatment modalities Discuss the procedure of incision for drainage Recall importance of biological aspects of the oral and peri-oral structures 			
			<p>Knowledge</p> <ul style="list-style-type: none"> Classify dental traumatic injuries Identify dental traumatic injuries Describe immediate and long-term management of dental traumatic injuries 	IC 2	LGIS / SGD	MCOs/SEQs
			<p>Skill</p> <ul style="list-style-type: none"> Perform emergency treatment and provide supportive care, prevention, and maintenance under supervision 	IC1 to IC6	Practical / Demonstration	OSCE
9.	Endodontic-Periodontic interrelationship	<p>3.</p> <ul style="list-style-type: none"> Discuss the importance and implications of the inter-relationship between 	<p>Attitude</p> <ul style="list-style-type: none"> Act ethically in seeking the best interdisciplinary care for patients Manage young patients with confidence and efficiency 	IC1 to IC6	Demonstration	OSCE

		Endodontics and other clinical disciplines, particularly periodontics	<p>Knowledge</p> <ul style="list-style-type: none"> Recall different types and clinical features of endo-perio lesion Diagnose endo-perio lesions on the basis of signs and symptoms and radiographic interpretation 	IC 2	LGIS / SGD / CBL	MCQs/SEQs/Viva
			<p>Skill</p> <ul style="list-style-type: none"> Perform periodontal probing 	IC1 to IC6	Demonstration Practical	OSCE
			<p>Attitude</p> <p>Demonstrate ethical outlook in treatment planning and patient communication</p>	IC 1	Demonstration Practical	OSCE
	Restoration of endodontically treated teeth	Apply knowledge of post application to restore endodontically treated teeth	<p>Knowledge</p> <ul style="list-style-type: none"> Define the structural and esthetic considerations for root filled teeth Describe different types of posts <p>Outline the restoration design teeth</p>	IC 2	LGIS	MCQs
			<p>Skill</p> <p>Perform restoration of endodontically treated</p>	IC1 to IC6	Practical / Demonstration	OSCE
			<p>Attitude</p> <p>Treat all patients with dignity and respect</p>	IC1 to IC6	Demonstration Practical	OSCE

S. No.	Topic/Theme	Learning Objective	IC CODES	MIT	Assessment Tools
1.	Endodontic instruments and procedures	<ul style="list-style-type: none"> Identify instrument design, function and formula Perform canal preparation techniques Perform obturation techniques and procedures 	IC 1 to IC 6	Demonstration	OSCE/Practical/ Viva
2.	Therapeutics and Anesthetics	<ul style="list-style-type: none"> Manage pain effectively and appropriately Diagnose, medicate and carry out procedures Communicate indications and contraindications and interaction of drugs Use intracanal medicaments uses and application 	IC 1 to IC 6	Demonstration/ Clinical quota	OSCE/Practical/ Viva
3.	Radiographs & radiographic interpretation	<ul style="list-style-type: none"> Discuss the importance and limitations of radiography in endodontics Identify endodontic pathology on radiographs Identify pathological structures in periapical radiographs 	IC 1 to IC 6	Demonstration	OSCE/Practical/ Viva



		<ul style="list-style-type: none">• Practice technique for taking different periapical radiographs• Implement safety measures			
4.	Emergency management	<ul style="list-style-type: none">• Manage trauma and inter-appointment emergencies• Manage a case of cracked tooth• Identify perforations in teeth• Manage a case of perforations	IC 1 to IC 6	Demonstration	OSCE/Practical/ Viva

2.Paediatric Dentistry

S. No.	Topic / Theme	Learning Outcomes	Learning Objectives	IC Codes	M.I.Ts	Assessment Tools
01	RADIOLOGY	<ul style="list-style-type: none"> Principles of radiation safety and the specific considerations for pediatric patients 	<ul style="list-style-type: none"> Explain the potential risks and benefits of dental radiographs in children. Differentiate between normal variations and abnormal findings in dental radiographs of children. 	<ul style="list-style-type: none"> 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. 	Lecture/Case-based learning/chairside learning	MCQ+ SEQ

2.	Pulp therapy in primary and young permanent teeth	<ul style="list-style-type: none"> • Diagnosis and treatment of pulp conditions in primary and young permanent teeth, pulpotomy, pulpectomy, apexification and apexogenesis. Follow up and recall. 	<ul style="list-style-type: none"> • 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 • 	<ul style="list-style-type: none"> • 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. <p>Plan and schedule appropriate follow-up and recall appointments to monitor the healing and long-term success of pulp therapy.</p>	Lectures; Case-based learning/Chair-side learning	MCQ+ SEQ

3	Space management and space maintainers	<ul style="list-style-type: none"> Evaluation of space needs, space maintenance options, management of early tooth loss 	<ul style="list-style-type: none"> 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. 	<ul style="list-style-type: none"> Perform a comprehensive oral examination to identify the need for space maintainers <p>Assess the space requirements and select the appropriate type of space maintainer</p>	Lecture/Case-based learning/chairside learning	MCQ+ SEQ
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4	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	<ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • 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. 	Lecture/Case-based learning/chairside learning	MCQ+ SEQ
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Practical

Weeks	Topic for SGD	Demonstration	Facilitator
1 st week	<ul style="list-style-type: none">• History taking• Diagnostic aids	<ul style="list-style-type: none">• Chair position• History taking• Clinical examination	Dr Beenish Dr Yumna

	<ul style="list-style-type: none"> • Diagnosis of pulpal and periapical diseases 		
2nd week	<ul style="list-style-type: none"> • Sterilization and infection control • Aseptic techniques • PPE 	<ul style="list-style-type: none"> • Pits and fissure sealants 	Dr Yumna
3rd week	<ul style="list-style-type: none"> • Preventive modalities and protocols • Indications for Pits and fissure sealants • Diet management for high risk patients 	<ul style="list-style-type: none"> • Matrix band application 	Dr Yumna Dr Amna
4th week	Term Exam		
5th week	<ul style="list-style-type: none"> • Fundamentals of tooth preparation • GV Blacks classification 	<ul style="list-style-type: none"> • Instruments and equipment for tooth preparation and restoration 	Dr Yumna Dr Amna
6th week	<ul style="list-style-type: none"> • Radiograph and Radiographic interpretation 	<ul style="list-style-type: none"> • Principles and interpretations of OPG, Periapical and bitewing radiographs • Clinical technique 	Dr Yumna Dr Sharaz
7th week	<ul style="list-style-type: none"> • Endodontic instruments 	<ul style="list-style-type: none"> • Identification of instruments for diagnosis, emergency treatment • Therapeutics • Intracanal medicaments 	Dr Sharaz
	Term Exam		

3. Prosthodontics

Topic / Theme	Learning Outcomes	Learning Objectives	IC Codes	MITs	Assessment Tools
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	At the completion of the session, the students should be able to:	At the completion of the session, the students should be able to:			
Materials Used In Management Of Edentulous Patients	Identify and manipulate various dental materials used in fabrication of dentures	<p>KNOWLEDGE</p> <ul style="list-style-type: none"> • Describe non-elastic and elastic impression materials • Describe disinfection protocols for various impression materials • Describe the polymeric denture base material • 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. 	IC-1, IC-2, IC-4	L.G.I.S	MCQs, SEQs &VIVA

		<ul style="list-style-type: none"> Describe adverse reactions to denture adhesives. Describe factors that contribute to the retention of dentures 			
Maxillary and mandibular substitutes for denture bearing area	Correlate the significance of Anatomical landmarks of maxilla and mandible with respect to biomechanics of a complete denture and for better	<p>KNOWLEDGE</p> <ul style="list-style-type: none"> Name maxillary and mandibular stress bearing areas <ul style="list-style-type: none"> Describe the supporting structures in maxilla and mandible Describe limiting structures in maxilla and mandible. 	IC-1, IC-2, IC-4	L.G.I.S SGD	MCQs, SEQs & VIVA
	Understand impression making in edentulous patients	<p>KNOWLEDGE</p> <ul style="list-style-type: none"> 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 	IC-1, IC-2, IC-4	L.G.I.S SGD	M.C.Qs. SEQs. & VIVA
		<p>SKILL</p> <p>Perform primary and secondary impression making using different impression materials and following border molding procedures</p>	IC1-IC6	Clinical Demonstrations	OSCE

		<p>ATTITUDE Should be clear and respectful in giving instructions for physiologic border molding</p>	IC1-IC6	-	-
	Posterior palatal seal	<p>KNOWLEDGE <ul style="list-style-type: none"> • Define posterior palatal seal area • Describe various methods used to record posterior palatal seal area </p>	IC-1, IC-2, IC-4	L.G.I.S SGD	M.C.Qs. SEQs. & VIVA
		<p>SKILL Record posterior palatal seal using low fusing compound</p>	IC1-IC6	Clinical Demonstrations	OSCE
		<p>ATTITUDE Should be clear and respectful in giving instructions</p>	IC1-IC6	-	-
	Beading and boxing after impression making	<p>KNOWLEDGE <ul style="list-style-type: none"> • Define boxing of an impression <ul style="list-style-type: none"> • Define dental cast • Differentiate between various types of casts • Describe the method for fabrication of custom tray </p>	IC-1, IC-2, IC-4	L.G.I.S SGD	M.C.Qs. SEQs.

		<p><u>SKILL</u></p> <ul style="list-style-type: none"> • Beading and boxing of secondary impression using modelling wax • Fabrication of primary and secondary cast using dental stone • Fabrication of custom tray using autopolymerizing resins for secondary impression making 	IC1-IC6	Clinical Demonstrations	-
Denture's Polished Surfaces	Describe different surfaces and parts of denture	<p><u>KNOWLEDGE</u></p> <ul style="list-style-type: none"> • Define various parts and surfaces of dentures • Describe the method for the fabrication of record bases 	IC-1, IC-2, IC-4	L.G.I.S SGD	M.C.Qs. SEQs.
		<p><u>SKILL</u></p> <p>Fabrication of record bases on master cast</p>	IC1-IC6	Clinical Demonstrations	OSCE
	Neutral zone concept	<p><u>KNOWLEDGE</u></p> <ul style="list-style-type: none"> • Define neutral zone • Explain significance of neutral zone in complete dentures 	IC-1, IC-2, IC-4	L.G.I.S SGD	M.C.Qs. SEQs. & VIVA

	Recording of maxillomandibular relationship	<p><u>KNOWLEDGE</u></p> <ul style="list-style-type: none"> • 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 effects of increased and decreased vertical dimension of occlusion 	IC-1, IC-2, IC-4	L.G.I.S SGD	M.C.Qs. SEQs.
		<p><u>SKILL</u></p> <p>Accurately record the vertical dimension and centric relation of edentulous patients</p>	IC1-IC6	Clinical Demonstrations	OSCE
		<p><u>ATTITUDE</u></p> <p>Should be kind and respectful</p>	IC1-IC6	-	-
	Use of articulators and facebow used for prosthodontic work	<p><u>KNOWLEDGE</u></p> <ul style="list-style-type: none"> • Classify articulators • Enumerate advantage and disadvantages of semi-adjustable articulators • Differentiate between ARCON and NON-ARCON articulators • Describe programming of an articulator. • Define facebow. • Describe the procedure for recording orientation relation using 	IC-1, IC-2, IC-4	L.G.I.S SGD	M.C.Qs. SEQs. VIVA

		a facebow. • Enlist advantages and indications of facebow			
		SKILL Demonstrate the procedure for mounting of casts on articulator	IC1-IC6	Clinical Demonstrations	-
Selection and Arrangement of Prosthetic teeth	Learn about selection of teeth and their arrangement using biometric guidelines	KNOWLEDGE Describe various theories for selection of artificial teeth	IC-1, IC-2, IC-4	L.G.I.S SGD	M.C.Qs. SEQs.
		SKILL Demonstrate the selection of teeth based on patients requirement	IC1-IC6	Clinical demonstration	-
	Arrangement of teeth	KNOWLEDGE • Enlist landmarks for complete denture teeth setup • Describe anterior tooth setup for maxilla and mandible • Describe posterior tooth setup for maxilla and mandible	IC-1, IC-2, IC-4	L.G.I.S SGD	M.C.Qs. SEQs.
		SKILL Arrange maxillary and mandibular anterior and posterior teeth following the records and biometric guidelines	IC1-IC6	Clinical demonstration	OSCE
	Learn occlusal concepts for complete dentures	KNOWLEDGE Explain various occlusal concepts for	IC-1, IC-2, IC-4	L.G.I.S SGD	M.C.Qs. SEQs. VIVA

		complete denture occlusion			
The Try-in Appointment	Describe the steps involved in denture try-in	KNOWLEDGE Describe the steps involved in denture try-in	IC-1, IC-2, IC-4	L.G.I.S SGD	M.C.Qs. SEQs. VIVA
		ATTITUDE Respect the patient	IC1-IC6	-	-
Prosthesis Insertion and Follow-up appointments	<ul style="list-style-type: none"> Describe the protocol for denture insertion Use pressure indicating paste Use BULL rule for occlusal equilibration 	KNOWLEDGE <ul style="list-style-type: none"> Describe the protocol for denture insertion <ul style="list-style-type: none"> Enlist indications for use of pressure indicating paste 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 	IC-1, IC-2, IC-4	L.G.I.S SGD	M.C.Qs. SEQs. VIVA
		SKILL <ul style="list-style-type: none"> Follow the insertion protocol of complete denture Use of pressure indicating paste and interpret the pattern for adjustment of denture bearing area 	IC1-IC6	Clinical Demonstration	OSCE

		<ul style="list-style-type: none"> Adjust the occlusion by spot grinding and using BULL's rule Recall the patient for follow up 			
		<p>ATTITUDE</p> <ul style="list-style-type: none"> Should be respectful towards patients Educate the patient about denture hygiene and other possible problems that can be encountered during adaptive phase 	IC1-IC6	-	-
Single Dentures	<ul style="list-style-type: none"> Diagnose and plan the single denture Manage complications associated with single dentures 	<p>KNOWLEDGE</p> <ul style="list-style-type: none"> Define a single denture Describe diagnosis and treatment planning for single dentures Describe possible complications associated with single dentures and their management 	IC-1, IC-2, IC-4	L.G.I.S SGD	M.C.Qs. SEQs. VIVA
Life span of complete denture	<ul style="list-style-type: none"> Understand the concept of relining or rebasing of the complete denture Describe the various indications and procedures of copy denture 	<p>KNOWLEDGE</p> <ul style="list-style-type: none"> 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 Describe various procedures involved in denture repair Define copy dentures 	IC-1, IC-2, IC-4	L.G.I.S SGD	M.C.Qs. SEQs. VIVA

		<ul style="list-style-type: none"> Describe the steps involved in fabrication of copy dentures 			
Speech Consideration with Complete Dentures	Diagnose and manage speech problems in patient with complete denture	<p style="text-align: center;"><u>KNOWLEDGE</u></p> <ul style="list-style-type: none"> Describe various sounds that may be affected by teeth position Describe prosthetic considerations in diagnosing and managing speech problems 	IC-1, IC-2, IC-4	L.G.I.S SGD	M.C.Qs. SEQs. VIVA
FIXED PARTIAL DENTURE					
Periodontal considerations	Understand the periodontal tissues evaluation for fixed partial denture	<p style="text-align: center;"><u>KNOWLEDGE</u></p> <ul style="list-style-type: none"> Describe the stages of periodontal disease progression Understand the concept of biologic width Describe the guidelines for margin placement in reference to biologic width Describe the procedure for site preparation for ovate pontic 	IC-1, IC-2, IC-4	L.G.I.S	M.C.Qs. SEQs. VIVA
Crown lengthening	Understand the crown lengthening procedure	<p style="text-align: center;"><u>KNOWLEDGE</u></p> <ul style="list-style-type: none"> Describe the indications of crown lengthening Describe the techniques for crown lengthening Describe the factors consider prior to crown lengthening procedure 	IC-1, IC-2, IC-4	L.G.I.S	M.C.Qs. SEQs. VIVA
Interim restoration	Understand the concept of interim restoration	<p style="text-align: center;"><u>KNOWLEDGE</u></p> <ul style="list-style-type: none"> Discuss the need for interim restoration Explain the biologic, esthetic and mechanical requirements of interim restoration 	IC-1, IC-2, IC-4	L.G.I.S	M.C.Qs. SEQs. VIVA

		<ul style="list-style-type: none"> • Describe various types of prefabricated crowns • Explain different techniques for interim restoration fabrication 			
Luting agents and cementation procedure	Understand the use of various luting agents	<p>KNOWLEDGE</p> <ul style="list-style-type: none"> • Discuss the properties of cements • Enlist the indications of various luting agent 	IC-1, IC-2, IC-4	L.G.I.S	M.C.Qs. SEQs. VIVA
		<ul style="list-style-type: none"> • Explain the conventional cementation method • Explain the luting procedure ceramic veneers, inlays and onlays 			
Resin retained FPDs	Understand the conservative treatment option for the replacement of missing teeth	<p>KNOWLEDGE</p> <ul style="list-style-type: none"> • Enlist the indication and contraindications of resin bonded fixed partial denture • Describe the advantages and disadvantages of fixed partial denture • Describe the design features of resin bonded bridge • Explain the cementation steps of resin bonded bridge 	IC-1, IC-2, IC-4	L.G.I.S	M.C.Qs. SEQs. VIVA
Management of complications	Understand the management of postoperative complication	<p>KNOWLEDGE</p> <ul style="list-style-type: none"> • Discuss the protocol followed during the post cementation appointments • Describe the management of post insertion complications 	IC-1, IC-2, IC-4	L.G.I.S	M.C.Qs. SEQs. VIVA







REMOVABLE PARTIAL DENTURE					
Introduction to Removable Partial denture	Differentiate between cast and acrylic partial dentures		IC-1, IC-2, IC-4	L.G.I.S	M.C.Qs. SEQs. VIVA



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		<p><u>KNOWLEDGE</u></p> <ul style="list-style-type: none">• Define a partial denture• Differentiate between cast partial			
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		<p>and acrylic partial dentures</p> <ul style="list-style-type: none"> • Enumerate components of cast partial denture • Define retention, support and stability • Enumerate objectives of prosthodontic treatment <ul style="list-style-type: none"> • Enlist indications for removable partial dentures • Enlist steps involved in diagnosis of a patient prosthodontic treatment options • Describe factors that affect prosthesis selection • Enlist the available prosthodontic treatment options 			
Clasp-Retained Partial Denture	Tooth-supported and tooth & tissue supported partial dentures	<p><u>KNOWLEDGE</u></p> <ul style="list-style-type: none"> • 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 	IC-1, IC-2, IC-4	L.G.I.S	M.C.Qs. SEQs. VIVA
Partially Edentulous Arches	Classification of partially edentulous arches	<p><u>KNOWLEDGE</u></p> <ul style="list-style-type: none"> • Enumerate requirements of an acceptable classification method 	IC-1, IC-2, IC-4	L.G.I.S	M.C.Qs. SEQs. VIVA

		<ul style="list-style-type: none"> • Describe Kennedy's classification • Enlist Applegate's rules • Describe advantages and drawbacks of Kennedy's classification 			
Biomechanics of Removable Partial Denture	Possible movements of a partial denture	<p>KNOWLEDGE</p> <ul style="list-style-type: none"> • Describe possible movements of a partial denture and various components that counter these movements. 	IC-1, IC-2, IC-4	L.G.I.S	M.C.Qs. SEQs. VIVA
Components of Removable Partial dentures	Connectors Identify components that serve as major and minor connectors	<p>KNOWLEDGE</p> <ul style="list-style-type: none"> • 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 	IC-1, IC-2, IC-4	L.G.I.S	M.C.Qs. SEQs. VIVA
	Rests and rest seats Recognize the role of rests in partial denture support	<p>KNOWLEDGE</p> <ul style="list-style-type: none"> • 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 	IC-1, IC-2, IC-4	L.G.I.S	M.C.Qs. SEQs. VIVA

Practical

Weeks	Topic /Theme	Learning Objectives	IC Codes	MITs	Assessment Tools
Week 1	<ul style="list-style-type: none"> • Orientation to prosthodontic department • History taking & clinical examination • Primary impressions of edentulous patients • Custom tray fabrication • Secondary impression 	<ul style="list-style-type: none"> • Use instruments & appliances • Demonstrate correct technique of history taking & clinical examination • Take primary impression using impression compound • Fabricate custom tray using auto polymerizing resins • Take secondary impression with zinc oxide eugenol using green stick as border molding material 	IC 1 to IC 6	Demonstration	OSCE/Practical
Week 2	<ul style="list-style-type: none"> • Maxillomandibular relationship • Teeth setup 	<ul style="list-style-type: none"> • Practice recording maxillomandibular relation using biometric guidelines • Practice tooth setup using records obtained from patients and also utilizing biometric guidelines 	IC 1 to IC 6	Demonstration	OSCE/Practical
Week 3	<ul style="list-style-type: none"> • Try-in • Laboratory procedures for denture processing 	<ul style="list-style-type: none"> • Demonstrate the verification of esthetic, phonetics, centric record & VDO at try-in of dentures • Perform flasking, de waxing, packing, curing and finishing of dentures 	IC 1 to IC 6	Demonstration	OSCE/Practical

Week 4	<ul style="list-style-type: none"> • Insertion of dentures and follow up 	<ul style="list-style-type: none"> • Perform the insertion of dentures and post insertion follow up management 	IC 1 to IC 6	Demonstration	OSCE/Practical
Week 5	Cast partial denture designing (Kennedy' class I &II)	<ul style="list-style-type: none"> • Design partial denture in Kennedy's class I & II 	IC 1 to IC 6	Demonstration SGD	OSCE/Practical
Week 6	Cast partial denture designing (Kennedy' class III &IV)	<ul style="list-style-type: none"> • Design partial denture design in Kennedy's class III & IV 	IC 1 to IC 6	Demonstration SGD	OSCE/Practical
Week 7 & 8	Anterior teeth Crown preparation	<ul style="list-style-type: none"> • Practice the preparation of anterior teeth for metal ceramic and all ceramic crowns 	IC 1 to IC 6	Demonstration SGD	OSCE/Practical
Week 9 & 10	Posterior teeth Crown preparation	<ul style="list-style-type: none"> • Practice the preparation of posterior teeth for metal ceramic crowns 	IC 1 to IC 6	Demonstration SGD	OSCE/Practical

4.Orthodontics

S. No.	Topic / Theme	Learning Outcomes	Learning Objectives	IC Codes	MITs	Assessment Tools
01	Diagnosis of Malocclusion	At the end of the term, the students will be able to: <ul style="list-style-type: none"> Apply the knowledge of orthodontic diagnosis Develop the problem list of an orthodontic case 	At the end of the lecture, the students will be able to: <u>Knowledge</u> <ul style="list-style-type: none"> Explain the method of extra-oral and intra-oral clinical examination Recall the need of planning appropriate diagnostic records 	IC 2	LGIS SGD	MCQ/SEQs Viva
			<u>Skill</u> <ul style="list-style-type: none"> Interpret the diagnostic records Formulate a comprehensive diagnosis and problem list 	IC 1 to IC 6	Demonstrations Practical	OSCE Practical
02	Bone Metabolism	<ul style="list-style-type: none"> Demonstrate the metabolic basis of orthodontic tooth movement Apply the knowledge of different orthodontic forces 	<u>Knowledge</u> <ul style="list-style-type: none"> Describe the different tissue changes involved in orthodontic tooth movement Describe the effects of different drugs on tooth movement 	IC 2	LGIS	MCQ/SEQs Viva

		on tooth movement	<ul style="list-style-type: none"> • Explain the deleterious effects of orthodontic tooth movement on periodontium • Relate bone metabolism with orthodontic tooth movement • Explain the effects of normal and excessive forces 			
03	Biomechanics	<ul style="list-style-type: none"> • Demonstrate the basic principles of biomechanics in Orthodontics • Apply the knowledge of the biomechanical properties of an orthodontic appliance • Apply the knowledge of anchorage in orthodontic biomechanics 	<p><u>Knowledge</u></p> <ul style="list-style-type: none"> • Explain the basic concepts of orthodontic biomechanics • Explain the different types of tooth movement and forces • Describe the ideal properties of an orthodontic appliance • Describe the biomechanical requirements of an orthodontic appliance • Define anchorage and explain its different types • Describe the methods used to enhance the anchorage 	IC 2	LGIS SGD	MCQ/SEQs Viva
			<p><u>Skill</u></p> <ul style="list-style-type: none"> • Design the orthodontic appliance based on the principles of biomechanics • Perform different wire bending techniques • Use different methods of re-enforcing anchorage in clinical orthodontic practice 	IC 1 IC 2 IC 4 IC 6	Demonstrations Practical	OSCE Practical

04	Malocclusion and treatment planning	<ul style="list-style-type: none"> Apply the knowledge of treatment planning for different orthodontic problems 	<p><u>Knowledge</u></p> <ul style="list-style-type: none"> Describe the different types of malocclusion Explain the basic principles of treatment planning 	IC 2	LGIS SGD	MCQ/SEQs Viva
			<p><u>Skill</u></p> <ul style="list-style-type: none"> Identify the orthodontic problems and their features Perform a comprehensive orthodontic diagnosis Organize an orthodontic problem list Formulate a treatment plan for different types of malocclusions 	IC 1 to IC 6	Demonstrations Practical	OSCE
05	Protocols used in mixed dentition	<ul style="list-style-type: none"> Demonstrate the concepts of prevention, interception and management of mixed dentition problems in Orthodontics 	<p><u>Knowledge</u></p> <ul style="list-style-type: none"> Identify different orthodontic problems in mixed dentition stage Discuss the protocols of controlling habits, serial extractions, space maintenance, space regaining, space supervision and growth modification 	IC 2	LGIS SGD	MCQ/SEQs Viva
			<p><u>Skill</u></p> <ul style="list-style-type: none"> Prevention, interception and management of different problems in the mixed dentition stage 	IC 1 to IC 6	Demonstrations Practical	OSCE Practical

Practical

Weeks	Topic /Theme	Learning Objectives	IC Codes	MITs	Assessment Tools
Week 1	Orientation to the Orthodontic department	<ul style="list-style-type: none"> • Develop familiarity with orthodontic instruments & appliances • Demonstrate knowledge of the techniques of history taking & clinical examination 	IC1 to IC 6	Demonstration	OSCE/Practical exam
Week 2	Impression taking & Radiology	<ul style="list-style-type: none"> • Demonstrate the techniques of impression taking & bite registration • Interpret different radiographs • Demonstrate skills in lateral cepha • Iometric tracing 	IC1 to IC 6	Demonstration	OSCE/Practical exam

Week 3	Lateral Cephalometry	<ul style="list-style-type: none"> • Demonstrate skills in lateral cephalometric tracing • Perform the lateral cephalometric analysis 	IC1 IC 2 IC 4	Demonstration	OSCE/Practical exam
Week 4	Basic wire bending exercises	<ul style="list-style-type: none"> • Demonstrate skills of basic wire bending in Orthodontics 	IC1 IC2	Demonstration	OSCE/Practical exam
Week 5	Cast Analysis Basic wire bending exercises	<ul style="list-style-type: none"> • Practice the basic technique of performing cast analysis • Demonstrate skills of basic wire bending in Orthodontics 	IC 1 IC 2 IC 4	Demonstration	OSCE/ Practical exam
Week 6	Cast Analysis Basic wire bending exercises	<ul style="list-style-type: none"> • Practice the basic technique of performing cast analysis • Demonstrate skills of basic wire bending in Orthodontics 	IC 1 IC 2 IC 4	Demonstration	OSCE/ Practical exam
Week 7	Mixed Dentition Analysis	<ul style="list-style-type: none"> • Practice the basic technique of performing mixed dentition analysis 	IC 1 IC 2 IC 4	Demonstration	OSCE/ Practical exam

5.OMFS:

S. No.	Topic/ Theme	Learning Outcomes	Learning Objectives	IC Code	MITs	Assessment Tool
01	Trauma: Dento- Alveolar Fractures	At the end of term student will be able to: <ul style="list-style-type: none"> • Diagnose and order relevant investigations 	At the end of lecture, student should be able to: <u>KNOWLEDGE</u> <ul style="list-style-type: none"> • Describe facial soft tissue and dento-alveolar injuries 	IC 2	LGIS CBL SGD	MCQ SEQ VIVA

		<ul style="list-style-type: none"> • Make appropriate referral related to Oral & Maxillofacial trauma presenting in Emergency or Out Patient Units • Diagnose & manage dentoalveolar & mandible fractures by closed methods 	<ul style="list-style-type: none"> • Classify dento-alveolar and soft tissue injury • Define abrasion, contusion, laceration and diagnose these injuries by history and clinical examination • State etiology of maxillofacial (hard and soft tissue) & dento-alveolar trauma 			
			<p><u>SKILL</u></p> <ul style="list-style-type: none"> • Evaluate dento-alveolar trauma by history, clinical and radiological examination • Manage dento-alveolar injuries and keep up to date with current guidelines 	IC 1 to IC 6	Demonstrations / Practical	OSCE
			<p><u>ATTITUDE</u></p> <ul style="list-style-type: none"> • Respect patients • Acquire Informed Consent 	IC 1 to IC 6	Demonstrations / Practical	OSCE
02	ATLS & Mandible Fractures	<ul style="list-style-type: none"> • Discuss the various airway management maneuvers • Discuss classification, principles of management and complications of mid face fractures 	<p><u>KNOWLEDGE</u></p> <ul style="list-style-type: none"> • State etiology of maxillofacial trauma • Describe ATLS and BLS • Describe various airway management maneuvers (surgical & non-surgical) • Classify mandibular fractures according to the type, site and favorability to reduction • Enlist complications of mandibular 	IC 2	LGIS SGD	MCQ SEQ VIVA

			<p>fractures</p> <ul style="list-style-type: none"> Describe open & closed methods of fracture reduction & treatment 			
			<p><u>SKILL</u></p> <ul style="list-style-type: none"> Examine patient with suspected mandibular fracture Diagnose mandibular fractures by eliciting signs & symptoms and Interpret radiographic investigations related to mandible fracture Formulate a treatment plan for mandibular fractures in adults and children Perform MMF via eye lets on study models 	IC 1 to IC 6	Demonstrations / Practical	OSCE
			<p><u>ATTITUDE</u></p> <ul style="list-style-type: none"> Respect patients Acquire informed consent 	IC 1 to IC 6	Demonstrations / Practical	OSCE
03	Mid-Face, NOE & ZMC Fractures	<ul style="list-style-type: none"> Discuss classification, principles of management and complications of mid face fractures 	<p><u>KNOWLEDGE</u></p> <ul style="list-style-type: none"> Classify mid face fractures (Lefort I, II & III) Discuss principles of management of 	IC 2	LGIS	MCQ SEQ VIVA

			<p>fractures of mid-face</p> <ul style="list-style-type: none"> • Discuss principles of management of fractures of zygomatic bone, arch, frontal bone and naso-orbitoethmoid (NOE) complex fracture • Enlist complications of mid and upper face fractures 			
04	Fire Arm Injury	<ul style="list-style-type: none"> • Discuss management of fire arm injuries 	<p><u>KNOWLEDGE</u></p> <ul style="list-style-type: none"> • Describe considerations in the management of pediatric and geriatric maxillofacial trauma • Describe principles of management of fire arm injuries involving the face 	IC 2	LGIS	MCQ SEQ VIVA
05	Pathology (Biopsy)	<ul style="list-style-type: none"> • Identify a potentially malignant lesion, can describe and perform steps of biopsy • Describe features of malignant lesion and order relevant investigations • Identify jaw cysts and tumours • Order relevant investigations, formulate treatment plan 	<p><u>KNOWLEDGE</u></p> <ul style="list-style-type: none"> • Describe the adjuncts to clinical screening of suspicious lesions • State the indications of biopsy • Describe each type of soft and hard tissue biopsy • Describe principles of biopsy • Describe methods of specimen orientation 	IC2	LGIS/ SGD	MCQ SEQ VIVA
			<p><u>SKILL</u></p> <ul style="list-style-type: none"> • Record history of a patient with potentially malignant lesions in oral and maxillofacial region 	IC 1 to IC 6	Demonstrations / Practical	OSCE

		<ul style="list-style-type: none"> • Manage a patient who has been irradiated, can identify a patient at risk of MRONJ & Osteoradionecrosis • Identify a patient with sinus pathology/ oroantral communication/fistula • Describe management of patient having root displaced in maxillary sinus 	<ul style="list-style-type: none"> • Order and interpret relevant investigations • Write a biopsy request form for histopathological examination and properly handle biopsy specimen • Follow up of a biopsy patient 			
			<p><u>ATTITUDE</u></p> <ul style="list-style-type: none"> • Respect patients • Acquire informed consent 	IC 1 IC 4	Demonstrations / Practical	OSCE
06	Jaw Cysts	<ul style="list-style-type: none"> • Discuss classification, indications and techniques for the management of jaw cysts 	<p><u>KNOWLEDGE</u></p> <ul style="list-style-type: none"> • Classify jaw cysts (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 	IC 2	LGIS/ SGD	MCQ SEQ VIVA
07	Jaw Tumor	<ul style="list-style-type: none"> • Identify jaw cysts and tumors • Discuss management of jaw tumors 	<p><u>KNOWLEDGE</u></p> <ul style="list-style-type: none"> • Describe the management of jaw tumors based on the types of resection: marginal, segmental, partial, total and composite 	IC 2	LGIS/ SGD	MCQ SEQ VIVA

			<ul style="list-style-type: none"> • Describe the management of benign soft tissue tumors • Describe the management of potentially malignant (pre-malignant) lesions • Describe the management of malignant tumors of the oral cavity according to the following factors: <ul style="list-style-type: none"> i. Histopathology ii. Grade and extracapsular spread iii. TNM staging • 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 			
08	Maxillary Sinus Disease	<ul style="list-style-type: none"> • Discuss treatment of sinusitis • Discuss oro-antral communication 	<p><u>KNOWLEDGE</u></p> <ul style="list-style-type: none"> • Evaluate a patient with maxillary sinus disease • Describe odontogenic and non-odontogenic infections of maxillary sinus and their differential diagnoses • Describe treatment of sinusitis • Classify oro-antral communication according to size and describe their management according to the time elapsed 	IC 2	LGIS	MCQ SEQ VIVA

			<ul style="list-style-type: none"> • Enlist the common maxillary sinus tumors of odontogenic and non-odontogenic origin, and describe their management • Describe difference between oro-antral communication and fistula and their management • Describe post-operative sinus precautions 			
09	Surgical Endodontics	<ul style="list-style-type: none"> • Discuss appropriate procedure, flap, technique and (root-end filling) materials for surgical endodontics 	<p><u>KNOWLEDGE</u></p> <ul style="list-style-type: none"> • Evaluate a patient with a periapical pathology and 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 	IC 2	LGIS	MCQ SEQ VIVA
10	Management of Patients Undergoing Radiation Therapy & MRONJ	<ul style="list-style-type: none"> • Describe the dental management of a patient undergoing radiotherapy to the oral & maxillofacial region 	<p><u>KNOWLEDGE</u></p> <ul style="list-style-type: none"> • State the mechanism of action of radiotherapy, regimes of radiotherapy and list its adverse oral effects • Describe the dental management of a patient undergoing radiotherapy to the OMF region • Define osteoradionecrosis • Describe its stages and management 	IC 2	LGIS	MCQ SEQ VIVA

			<p>plan</p> <ul style="list-style-type: none"> • 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 			
CLASS TEST						
Week 09	INFECTION ODONTOGENIC INFECTIONS: etiology	At the end of term, student will be able to: <ul style="list-style-type: none"> • Identify a facial space infection, determine severity of disease and manage a patient with primary facial space infection 	<p><u>KNOWLEDGE</u></p> <ul style="list-style-type: none"> • Discuss factors (host, micro-organisms, anatomical) that govern the spread of odontogenic infections 	IC 2	LGIS/ SGD	MCQ SEQ VIVA
			<p><u>SKILL</u></p> <ul style="list-style-type: none"> • Evaluate a patient with an odontogenic or maxillofacial infection • order and interpret relevant investigations 	IC 1 to IC 6	Practical	OSCE
			<p><u>ATTITUDE</u></p> <ul style="list-style-type: none"> • Respect patients • Acquire Informed Consent 	IC 1 IC 4	Demonstrations / Practical	OSCE

Week 10	FACIAL SPACES	<ul style="list-style-type: none"> Describe various primary & secondary facial spaces 	<p><u>KNOWLEDGE</u></p> <ul style="list-style-type: none"> Diagnose and differentiate between edema (inoculation), cellulitis and abscess Describe anatomical fascial spaces in head & neck(boundaries and contents) which may get involved by spread of odontogenic infections 	IC 2	LGIS	MCQ SEQ VIVA
	ODONTOGENIC INFECTIONS: pathophysiology & management		<p><u>KNOWLEDGE</u></p> <ul style="list-style-type: none"> Describe spread, pathophysiology & management of following infections in head and neck <ol style="list-style-type: none"> Odontogenic infection to primary and secondary facial spaces Cavernous sinus thrombosis/orbital cellulitis mediastinitis Ludwig's angina Osteomyelitis, candidiasis, necrotizing fasciitis, actinomycosis 	IC 2	LGIS	MCQ SEQ VIVA
			<p><u>SKILL</u></p> <ul style="list-style-type: none"> Formulate management plan for odontogenic infections under following principles: <ul style="list-style-type: none"> Remove the etiology Drain surgically pus and insert drains; if indicated Provide supportive therapy: select appropriate antibiotic and 	IC 1 to IC 6	Practical	OSCE

			<p>manage airway, nutrition, and hydration</p> <ul style="list-style-type: none"> Select and prescribe appropriate antibiotic(s) for odontogenic infections Refer when indicated 			
			<p>ATTITUDE</p> <ul style="list-style-type: none"> Respect patients Acquire informed consent 	IC 1 to IC 5	Demonstrations / Practical	OSCE
Week 11	ANTIBIOTIC PROPHYLAXIS	<ul style="list-style-type: none"> Prescribe appropriate antibiotics and ascertain the requirement of prophylactic antibiotics in relevant patients 	<p>KNOWLEDGE</p> <ul style="list-style-type: none"> Describe prophylactic antibiotic cover, different Antibiotics with recommended dosages Describe protocol for antibiotic prophylaxis Justify prophylaxis against infectious endocarditis and total joint replacement 	IC 2	LGIS	MCQ SEQ VIVA

PRACTICAL

Week & Date	Topic/ Theme	Learning Objective	M.I.Ts	Assessment Tools	Instructor
01	Orientation to OMFS	<ul style="list-style-type: none"> Orientation to OMFS Perform Chair & Operator Positioning Obtain appropriate History perform Clinical Examination Perform Prescription Writing 	*SGD/ Demo *Practical	*OSPE *VIVA *DOPS	*Dr. Maimoona *Dr. Adam
02	Local Anesthesia	<p>Identify & Describe LA</p> <ul style="list-style-type: none"> Armamentarium Dosage 	*SGD/ Demo *Practical	*OSPE *VIVA *DOPS	*Dr.Fatima *Dr.Adam

		<ul style="list-style-type: none"> • Complications • anatomical landmarks for various LA techniques <p>Perform various techniques of Nerve Blocks & local anesthesia</p>			
03	Exodontia	<ul style="list-style-type: none"> • Identify and select appropriate Armamentarium • Describe and apply Principles of instruments used in exodontia • Application and Handling of elevators & forceps. • Interpret Radiological findings related to exodontia: Periapical & OPG , impacted canine & 3rd molars 	*SGD/ Demo *Practical	*OSPE *VIVA *DOPS	*Dr.Fatima *Dr.Adam
04	Medical Management of Compromised Patients TMJ and Pathology	<ul style="list-style-type: none"> • Describe Common Medical Emergencies with Prevention, Diagnosis & Management • Enlist Emergency trolley drugs • Operate & handle Oxygen Cylinder • Perform Clinical Examination of TMJ, Salivary Glands and Lymph Nodes • Perform Reduction of Dislocated TMJ on skull models 	*SGD/ Demo *Practical *PBL	*OSPE *VIVA	*Dr. Maimoona *Dr.Sadia
05	Basic Principles of Surgery	<ul style="list-style-type: none"> • Describe various suturing material types, their application , specification of suturing needle and suture • Perform various Suturing Techniques • Draw and label various surgical flaps used in minor oral surgery • Identify and use of appropriate size/number blade according to purpose 	*SGD/ Demo *Practical	*OSPE *VIVA *DOPS *Assignment	*Dr. Sadia *Dr.Adam

		<p>and anatomical region</p> <ul style="list-style-type: none"> • Handling of Surgical Blade , placement and removal from BP Handle • Describe Principles of Surgical Incision • Describe principles of Incision & Drainage • Describe Principles of Flap Design 			
06	Oral & Maxillofacial Trauma	<ul style="list-style-type: none"> • Describe various reduction & fixation techniques used in maxillofacial fracture management • Make Eye-lets with wire & wire handling • Perform Maxillo-Mandibular Fixation on Models • Placement of arch bar on models • Radiological interpretation of Trauma patient (OPG & CT Scan) • Identification of armamentarium for Major & Minor Surgical Procedures • PBL 	*SGD/ Demo *Practical *PBL	*OSPE *VIVA *Assign- ment	*Prof.Dr.Irfan Shah *Dr. Maimoona *Dr.Fatima
07	ASSESMENT WEEK	<ul style="list-style-type: none"> • Complete and Submit LOG BOOKS • Submit Assignments • End of Rotation Ward Test 		*DOPS *OSPE *VIVA *Assign- ments *Attendanc e	All Faculty



Term II Syllabi

Operative Dentistry

WEEK	TOPIC	NO OF LECTURES	DELIVERED BY
2nd TERM			
13 th Week	Introduction to endodontics Tooth morphology & access cavity preparation	01 01	Prof Dr Beenish
14 th Week	Preparation of radicular pulp space	02	Dr Sharaz
15 th Week	Irrigants & antiseptics Intra canal medicaments	02	Prof Dr Beenish
16 th Week	Obturation	02	Prof Dr Beenish
17 th Week	Class test Vital pulp therapies	01	Prof Dr Beenish



18 th Week	Vital pulp therapies	01 01	Prof Dr Beenish
19 th Week	Surgical endodontics	02	Dr Sharaz
20 th Week	Endo perio lesions	02	Prof Dr Beenish
21 st Week	Traumatic injuries in permanent dentition	02	Prof Dr Beenish
22 nd Week	Endodontic emergencies	02	Dr Sharaz
23 rd Week	Root resorption	02	Dr Sharaz
24 th Week	Failure in endodontics	02	Prof Dr Beenish
25 th Week	Restoration of endo treated teeth	02	Prof Dr Beenish
26 th Week	2 nd term exam		





Prosthodontics

2nd TERM (14 WEEKS)

WEEKS	TOPIC	NO. OF LECTURES	LECTURE DELIVERED BY
WEEK 13	• Recording impression in complete denture-I	02	Dr. Sameen Zehra
	• Recording impression in complete denture-II		Dr. Sameen Zehra
WEEK 14	• Posterior palatal seal	01	Dr. Aamir Rafiq
	• Maxillomandibular relationship-I	02	Dr. Sameen Zehra
WEEK 15	• Maxillomandibular relationship-II		01
	• Articulators and programming of articulators	Dr. Sameen Zehra	
WEEK 16	• Selection of artificial teeth	01	Dr. Sameen Zehra
	• Occlusion of complete denture-I	02	Dr. Sameen Zehra
WEEK 17	• Occlusion of complete denture-II		01
	• Denture insertion	Dr. Sameen Zehra	
WEEK 18	• Post insertion follow up	01	Dr. Sameen Zehra
	• Single denture	01	Dr. Sameen Zehra
WEEK 19	• Copy denture	01	Dr. Aamir Rafiq
	• Immediate denture-I	02	Dr. Aamir Rafiq
WEEK 20	• Immediate denture-II		02
	• Over denture-I	Dr. Sameen Zehra	
WEEK 21	• Over denture-II	01	Dr. Sameen Zehra
	• Speech consideration of complete denture		Dr. Abdul Muqeet
WEEK 22	• Relining and rebasing of complete denture	01	Dr. Sameen Zehra
	• Introduction to RPD	01	Dr. Aamir Rafiq
WEEK 23	• Classification of partially edentulous arches	01	Dr. Aamir Rafiq



	<ul style="list-style-type: none">• Biomechanics of CPD	01	Dr. Aamir Rafiq
WEEK 24	<ul style="list-style-type: none">• Rest and rest seat	01	Dr. Aamir Rafiq
	<ul style="list-style-type: none">• Major Connectors-I	02	Dr. Aamir Rafiq
WEEK 25	<ul style="list-style-type: none">• Major connectors-II		Dr. Aamir Rafiq
	<ul style="list-style-type: none">• Minor Connectors	01	Dr. Aamir Rafiq
WEEK 26	TERM EXAM		



Orthodontics

2nd TERM ACADEMIC CALENDAR - FINAL YEAR BDS (2024)

WEEK	DAY/DATE	TOPIC	SUBTOPICS	TOTAL LECTURES	FACILITATOR
1st Week	Tuesday (19-03-2024)	Diagnostic aids in Orthodontics	Diagnosis of malocclusion	02	Dr. Shahzonia
	Thursday (21-03-2024)				
2nd Week	Tuesday (26-03-2024)	Metabolic basis	Bone metabolism	05	Dr. Hasnain
	Thursday (28-03-2024)				
	Friday (29-03-2024)				
3rd Week	Tuesday (02-04-2024)				
	Thursday (04-04-2024)				
EID-UL-FITR HOLIDAYS (08th – 14th APRIL)					
4th Week	Tuesday (16-04-2024)	Orthodontic Appliances & Biomechanics	Biomechanics	02	Dr. Hasnain
	Thursday (18-04-2024)		Anchorage	02	
	Friday (19-04-2024)				
5th Week	Tuesday (23-04-2024)				

6th Week	Thursday (25-04-2024)	Malocclusion & Treatment planning	Class I malocclusion management	02	Dr. Shahzonia	
	Tuesday (30-04-2024)		Class II malocclusion management <ul style="list-style-type: none"> • Class II Div 1 • Class II Div 2 	02	Dr. Shahzonia	
	Thursday (02-05-2024)			Class III malocclusion	01	Dr. Hasnain
	Friday (03-05-2024)				2nd TERM CLASS TEST	
7th Week	Tuesday (07-05-2024)	Malocclusion & Treatment planning	Cross bite management	02	Dr. Waheed	
	Thursday (09-05-2024)		Protocols used in relieving dental and skeletal problems during mixed dentition	01	Dr. Hasnain	
8th Week	Tuesday (14-05-2024)	Malocclusion & Treatment planning	Open bite management	01	Dr. Waheed	
	Thursday (16-05-2024)		Deep bite management	01		
	Friday (17-05-2024)	Malocclusion & Treatment planning				
9th Week	Tuesday (21-05-2024)	Malocclusion & Treatment planning				
	Thursday (23-05-2024)					

10th Week	Tuesday (28-05-2024)	Protocols during mixed dentition	Protocols used in relieving dental and skeletal problems during mixed dentition	07	Dr. Hasnain
	Thursday (30-05-2024)				
	Friday (31-05-2024)				
11th Week	Tuesday (04-06-2024)				
	Thursday (06-06-2024)				
12th Week	Tuesday (11-06-2024)				
	Thursday (13-06-2024)				
Summer vacations & Eid ul Adha (17th June – 3th July)					
13th Week	Tuesday (25-06-2024)	Protocols during mixed dentition	Protocols used in relieving dental and skeletal problems during mixed dentition	02	Dr. Hasnain
	Thursday (27-06-2024)				
14th Week	2nd Term Exam (8th July – 14th July)				

OMFS

WEEK	TOPIC	NO OF LECTURES	NAME OF LECTURER
13	TRAUMA <ul style="list-style-type: none"> • Dentoalveolar fractures 	02	Dr. Fatima Khattak

	<ul style="list-style-type: none"> Soft tissue injuries 		
14	<p>TRAUMA:</p> <ul style="list-style-type: none"> ZMC fractures 	02	Prof.Dr.Irfan Shah
15	<p>TRAUMA</p> <ul style="list-style-type: none"> Lefort Fractures Fire-Arm Injuries Management of pediatric & geriatric patients NOE and Frontal bone fracture 	03	Prof. Dr.Irfan Shah
16	<p>PATHOLOGY (1)</p> <ul style="list-style-type: none"> biopsy <p>INFECTION(1)</p> <ul style="list-style-type: none"> Odontogenic Infections (etiology & sign/symptoms) 	01 01	Dr.Maimoona Siddiq Dr. Fatima Khattak
17	<p>PATHOLOGY (2)</p> <ul style="list-style-type: none"> Jaw Cyst Jaw Tumor <p>INFECTIONS (1)</p> <ul style="list-style-type: none"> Odontogenic Infections (spread & management) 	03	Dr. Maimoona Siddiq Dr. Fatima Khattak
18	<p>PATHOLOGY</p> <ul style="list-style-type: none"> Maxillary Sinus Disease 	02	Dr. Maimoona Siddiq
19	<p>PATHOLOGY(1)</p> <ul style="list-style-type: none"> Endodontic Surgery <p>INFECTION(2)</p> <ul style="list-style-type: none"> Facial spaces 	03	Dr. Maimoona Siddiq Dr. Fatima Khattak
20	CLASS TEST		

now presents with bone loss accompanied with excessive and hyperplastic (flabby) tissues in the maxillary anterior region. The tissues in maxillary anterior teeth are sore as his mandibular teeth occlude and traumatize the area.



LEARNING OBJECTIVE

At the end of PBL session students will be able to:

- Diagnose the clinical condition
- Identify the intraoral conditions that can be associated with combination syndrome
- Identify the cause of bone loss in maxillary anterior region



- Select proper impression techniques.
- Manage the patients with partial edentulism
-

LEARNING RESOURCES

- Prosthodontic treatment for edentulous patient by GA Zarb 13th edition
- McCracken's removable partial prosthodontics 13th edition

Case-Based Learning

Department of OMFS

A 60-year-old male patient with a history of cardiac disease comes to department of OMFS for the extraction of mandibular left first molar tooth. Patient is on medication for hypertension and taking anticoagulants. His history revealed he had unhealthy lifestyle. He seemed very anxious about dental treatment and neglected his oral health previously. After examination the tooth number #36 deemed unrestorable and extraction was advised for #36. On examination his vitals were within normal limits. While performing extraction under local anaesthesia the patient develops chest discomfort on felt pain on the left side.

Learning Objectives:

- 1) Prevent Chest Pain
- 2) Diagnose chest pain
- 3) Differentiate between types of chest pain
- 4) Manage chest pain on dental unit

Learning Resources:

Contemporary Oral and Maxillofacial Surgery

- James R. TUCKER
- Crispean Scully



Learning Resources

1. Operative Dentistry

- Sturdevant's Art & Science of Operative Dentistry
- Cohan's Pathways of Pulp
- Grossman Endodontic practice
- Contemporary Fixed Prosthodontics Rosenstiel
- Paediatric Dentistry, Richard Welbury

2. Oral And Maxillofacial Surgery

1. Contemporary Oral and Maxillofacial Surgery, 7th Edition, James R. Hupp
2. Handbook of Local Anesthesia, 7th Edition, Stanley F. Malamed
3. Fractures of the Facial Skeleton, 2nd Edition, Peter Banks
4. Scully's Medical Problems in Dentistry, 7th Edition, Crispian Scully
5. Internet Sources

<https://www.sciencedirect.com/> <https://emedicine.medscape.com/>

3. Orthodontics

- Contemporary Orthodontics William R. Proffit
- An Introduction to Orthodontics Laura Mitchell

4. Prosthodontics

- Prosthodontic treatment for edentulous patients, Thirteen Edition by Zarb and Hobkirk
- McCracken's Removable Partial Prosthodontics, Thirteen Edition
- Contemporary Fixed Prosthodontics Rosenstiel

