LAHORE
MEDICAL & DENTAL
COLLEGE

DENTAL MATERIALS STUDY GUIDE

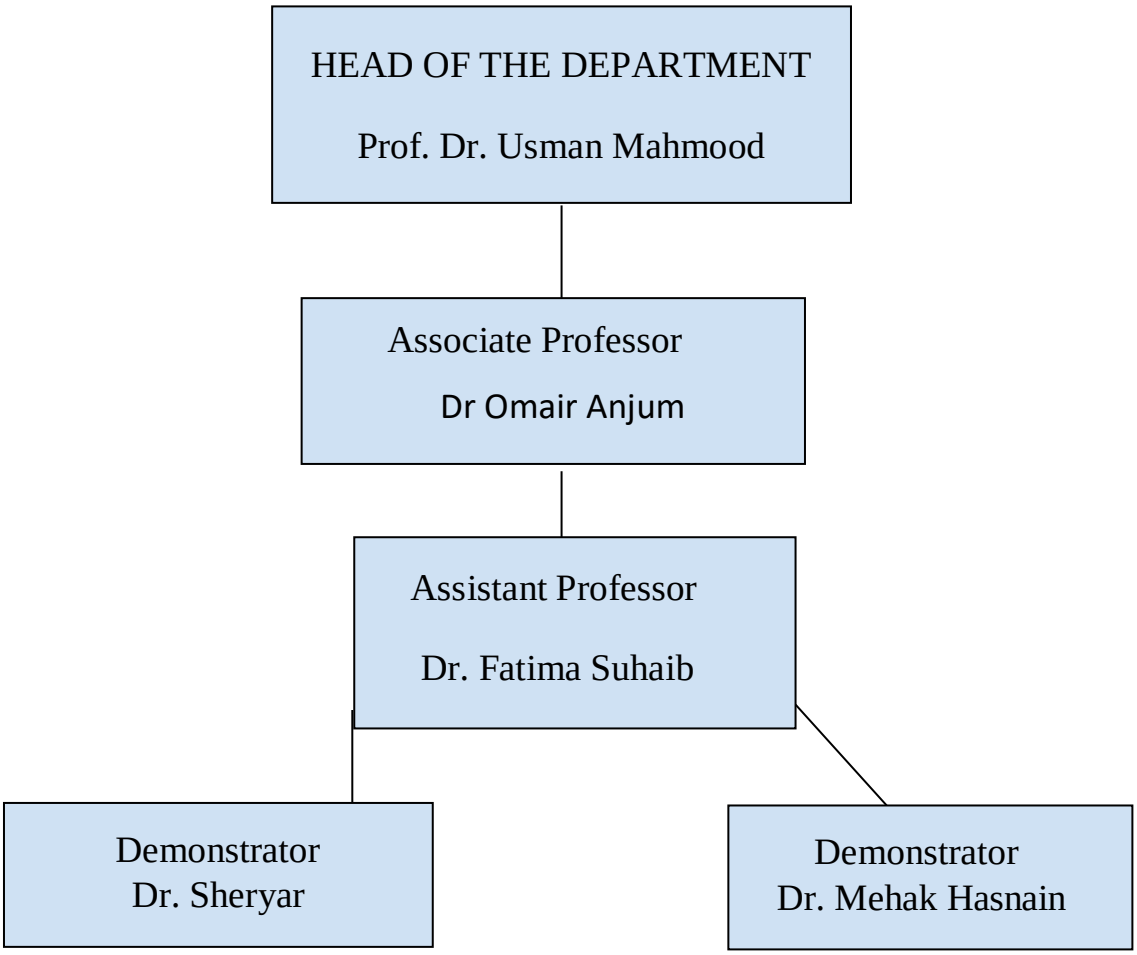
SECOND YEAR BDS

2024

DEPARTMENT OF SCIENCE OF

DENTAL MATERIALS

DEPARTMENTAL ORGANOGRAM/HIERARCHY



CONTENTS

1. INTRODUCTION

The study guide has been prepared for facilitation of 2nd Year BDS students regarding the curriculum of dental materials

2. STUDY GUIDE OBJECTIVES

The guide will prepare the students by giving them all the necessary information and guidance regarding the subject and course work.

3. UHS SYLLABUS, ToS, EXAMINATION RULES AND REGULATIONS

Course duration:

- 36 weeks per academic year
- 1.5 hours lecture per week for 36 weeks (54 hrs)
- 2.5 hours practical for 36 weeks (90 hrs)
- Two hours tutorials/interactive group discussion classes per week (72 hrs)
- Presentation session at the end of academic year in Preclinical classes (16 hrs)
- Total teaching hours for the subject of dental materials (232 hrs)

Teaching objectives:

- To teach the students the physical, mechanical, chemical & biological properties of all materials used in conventional & modern dentistry.
- To teach the student an understanding of properties and handling of materials as essential for both clinical and laboratory settings.
- To equip the students of the composition, manipulative techniques, application of dental materials and their interaction with the oral environment.
- To teach the students the scientific background and the clinical skills required to handle modern dental materials.
- To enable students to practice the manipulative techniques before their application in the clinical setup.
- To undertake practical classes that would teach the students the manipulation and clinical handling of modern dental materials.
- Developing skills as a self-directed learner, recognizing continuing educational needs; use appropriate learning resources and critically analyze relevant literature in order to have a comprehensive understanding and knowledge of Dental Materials.

UHS Course content

Physical and Mechanical Properties

Learning Outcomes	Learning Objectives	Learning Domains			Mode of Information Transfer (MIT)	Assessment Tools
		Knowledge	Skill	Attitude		
Introduction to the Subject	Describe the importance of materials in Dentistry	C1			Lecture	MCQs SEQs Vivas OSPE Assignments
Physical properties of dental materials	Define Abrasion, abrasion resistance, viscosity, creep flow, color and color perception, hue, value, chroma and metamerism.	C1			Lecture	
	Define Thermal conductivity, thermal diffusivity, co efficient of thermal expansion, heat of fusion and specific heat.	C1			Lecture	
	Define dielectric constant, EMF series.	C1			Lecture	
	Define Tarnish and Corrosion.	C1			Lecture	
	Classification and types of corrosion, prevention of tarnish and corrosion					

	Application of physical properties in dental materials	C2 C3			Lecture PBL	
Mechanical Properties of dental materials	Define stress, types of stress, strain, Explain the stress strain curve Define elastic deformation(proportional limit, elastic limit, young's modulus, resilience) Define yield strength, ultimate strength, flexural strength, fracture toughness, fatigue strength, impact strength, tear strength. Define hardness and types of hardness wear Application of mechanical properties in dental materials	C1 C2 C2 C1 C1 C3			Lecture Lecture Lecture Lecture Lecture PBL	

Dental Cements

Learning Outcomes	Learning Objectives	Learning Domains			Mode of Information Transfer (MIT)	Assessment Tools
		Knowledge	Skill	Attitude		
Introduction and classification	Classify dental cements. Differentiate between temporary and permanent cements. Difference between liners, bases	C2 C4 C4			Lecture SGD SGD	MCQs SEQs Vivas OSPE Assignments
Zinc Phosphate Zinc Oxide Eugenol Calcium Hydroxide Zinc Polycarboxylate	Discuss the setting chemistry associated with Zinc Phosphate, Zinc Oxide Eugenol, Calcium Hydroxide, Zinc Polycarboxylate Discuss properties of dental cements.	C2 C2			Interactive Lecture Presentations	
Manipulation and setting characteristics	Mix: - Zinc phosphate cement as a luting agent and base; - Glass ionomer cement as a luting			S2 S2	Practical Practical	

	agent and restorative Calcium hydroxide as a cavity lining agent.			S2	Practical	
GIC	Historical background of Silicates, evolution of GIC. Describe the composition and properties of GIC. Describe the: - Setting reaction of GIC; Fluoride release and ion exchange Discuss the significance of modified GIC constituents, the influence on properties and the impact on the material's clinical performance.	C2 C2 C2			Lecture Lecture SGD	
Application of dental cements	Discuss the requirements of dental cements for cavity lining, luting, endodontic and orthodontic purposes. Discuss the various uses of dental cements	C2 C2	Interactive Lecture Lecture			

	in different applications					

Dental Composites

Learning Outcomes	Learning Objectives	Learning Domains			Mode of Information Transfer (MIT)	Assessment Tools
		Knowledge	Skill	Attitude		
Introduction and classification	Describe historical pretext of dental composites. Describe components and composition of dental composites. Classify dental composites.	C2 C2 C2			Lecture Interactive Lecture Interactive Lecture	MCQs SEQs Vivas OSPE Assignments
Properties and Setting Characteristics	Discuss the setting chemistry associated with composites. Discuss properties of dental composites.	C2 C2			Interactive Lecture SGD	
Manipulation of Dental Composites	Describe the methods of curing composites and minimizing polymerization shrinkage.	C2			Interactive Lecture	
Application of dental composites	Correlate filler particle size, setting reaction and method of manufacture of dental composite resin based restorative materials with properties and behaviour of the material in situ. Discuss the use of composites in vivo.	C4 C2			PBL SGD	

	Describe new resin based restorative materials variants available in the market. Compare the types of dental composites according to their clinical use.	C2 C3			Lecture PBL	

Bonding

Learning Outcomes	Learning Objectives	Learning Domains			Mode of Information Transfer (MIT)	Assessment Tools
		Knowledge	Skill	Attitude		
Introduction	Describe: - Adhesion; - Acid etching; - Conditioning; - Priming.	C2			Lecture	MCQs SEQs Vivas OSPE Assignments
Bonding systems and Smear layer	Describe the following - Enamel and Dentin bonding agents; - Bonding systems. - Generations of Bonding Systems Define smear layer. Discuss the importance of smear layer as a determinant of the clinical success of dental composites.	C2 C2			Interactive Lecture	

Bonding at tooth-restoration interface	Describe hybridization in relation to dental composites. Discuss the dental composite adhesion to tooth structure based on the principles of micromechanical attachment.	C2 C2			Interactive Lecture/Videos	

Dental Amalgam

Learning Outcomes	Learning Objectives	Learning Domains			Mode of Information Transfer (MIT)	Assessment Tools
		Knowledge	Skill	Attitude		
Introduction	Discuss the requirements and historical perspective of direct filling/ restorative materials. Describe the primary purpose of each component of amalgam alloy. Relate the importance of the role of mercury/alloy ratio and its influence/effect on the setting reaction and restorative procedures. Describe the manufacturing technique for Amalgam alloy powder.	C2 C2 C4 C2			Lecture Lecture PBL Lecture	MCQs SEQs Vivas OSPE Assignments
Setting characteristic	Discuss the setting chemistry associated with	C2			Interactive Lecture	

s and properties	amalgam production. Discuss properties of dental amalgam and high copper amalgam.	C2			SGD	
Clinical Handling and Manipulative variables	Discuss: - Ideology of Black's cavity design; - Cavity design and matrices with regard to properties of the material. Importanc e of use of varnishes. Correlate the manipulative parameters of amalgam with the properties of the final restoration.	C2 C3			Interactive Lecture/Vid eos PBL	
Environment al Consideratio ns – Dental Amalgam	List the hazards of incorrect handling of mercury. Discuss the importance of mercury hygiene, mercury/amalgam scrap handling and disposal at chair side.	C1 C2			SDL Lecture	
Mixing and Manipulation	Perform the mixing of Amalgam alloy powder and mercury Manipulation of Amalgam (Trituration, Condensation, Carving & Finishing)		S2 S1		Practical Practical	

Metals

Learning Outcomes	Learning Objectives	Learning Domains			Mode of Information Transfer (MIT)	Assessment Tools
		Knowledge	Skill	Attitude		
Gold	Define and classify Direct filling gold	C1			Lecture	MCQs SEQs Vivas OSPE Assignments
	Discuss manipulation, advantages, disadvantages and uses	C2			Lecture	
Casting	Discuss the basic concepts related to processing and solidification of dental alloys.	C2			Interactive Lecture	
	Understand different types of metals and alloys used in fabrication of dental prosthesis.	C2			Presentations	
	Describe the alloy phase diagrams.	C2			Lecture	
	Explain the types, processing and clinical applications of high noble and noble metal alloys	C2			Lecture	
	Explain the types, processing and clinical applications of base metal alloys.	C2			Lecture	
	Describe the casting procedures for metal alloys.	C2			SGD	
	Discuss the types, processing and clinical applications of wrought metal alloys.	C2			Lecture	
		C2			Lecture	

	Discuss the types, processing and clinical applications of stainless steel in dentistry Explain the casting procedure for Titanium and its alloys. Describe the properties and composition of various Orthodontic wires	C2			Lecture	
Soldering	Descibe the objectives and usesof soldering and welding in dentistry	C2			Lecture	
Welding	Differentiate between soldering, brazing and welding Describe the components of dental solders and welding Describe different heat sources for soldering and welding	C3 C2 C2			SGD Lecture Lecture	
Dental Implants	Describe the historyof implants in dentistry. Define osseointegration and factors affecting it. Classification of Dental Implants Discuss different materials used as dental implants	C2 C2 C2 C2			Interactive Lecture Lecture Lecture SGD	

Dental Ceramics

Learning Outcomes	Learning Objectives	Learning Domains			Mode of Information Transfer (MIT)	Assessment Tools
		Knowledge	Skill	Attitude		
Introduction	Describe the historical evolution of Dental ceramics	C2			Lecture	MCQs SEQs Vivas OSPE Assignments
	Classify Dental Ceramics	C2			Lecture	
	Discuss the composition and properties of dental ceramics.	C2			SGD	
Properties and Composition	Co relate the different types of ceramics and mechanisms of manufacturing.	C3			PBL	
	Describe the metal fused to ceramic system, properties and bonding.					
	Explain the methods of strengthening ceramics	C2			Lecture	
		C2			Lecture	

Dental Polymers

Learning Outcomes	Learning Objectives	Learning Domains			Mode of Information Transfer (MIT)	Assessment Tools
		Knowledge	Skill	Attitude		
	Discuss the terminologies	C2			Interactive	

Dental Polymers	used in Dental Polymer. Describe the major components (MMA / PMMA) composition along with its role in Dental Polymer. Describe and explain the mechanism and its properties (Mechanical and Physical) Enumerate types of Polymerization Reactions. Discuss the role of Co-Polymerization	C2 C2 C1 C2			Lecture Lecture Lecture SDL SGD	MCQs SEQs Vivas OSPE Assignments
Denture Base Materials	Explain Acrylic Resin according to types of Setting reaction along with its composition (Heat, Chemical, Microwave & Light) Classify Denture Base Materials Describe manipulation and steps involved in fabrication of Denture Base in Laboratory.	C2 C2 C2			Lecture Lecture Lecture/ Videos	

Denture Base Materials	Enumerate the advantages and disadvantages of packing of Denture Base Resins in different manipulating Physical stages. Differentiate between various fabricating techniques used in Denture base resins. Enlist physical properties of Denture base resin. Explain Biocompatibility and Infection Control of Denture base materials in medically compromised patients. Enlist Denture Base Cleansers Perform Mixing/ Manipulation of powder and liquid of Denture Base Materials Identify the five physical stages in mixed acrylic resin.	C1 C3 C1 C2 C1	S2		SDL PBL SDL Lecture SDL Practical	

			S2		Practical	
Denture Base Lining Materials	Describe different techniques used to repair Acrylic Resins. Discuss the concept of Relining and Rebasing. Explain the conditions in which Relining and Rebasing is preferable. Differentiate between the concept of using soft tissue Liners / Tissue Conditioner and hard tissue Liners.	C2 C2 C2 C3			Lecture SGD Lecture PBL	
Separating Media	Enlist different separating media used in dentistry. Discuss the clinical and laboratorial indications of using Separating media Identification of separating media	C1 C2 S2			SDL SGD Practical	

Casting

Learning Outcomes	Learning Objectives	Learning Domains			Mode of Information Transfer (MIT)	Assessment Tools
		Knowledge	Skill	Attitude		
Appraise casting procedures for fabrication of ceramic-fused-to-metal prosthesis	Explain various steps involved in casing procedure. Describe sprue design. Describe the causes of defective casting. Discuss measures to overcome defective casting. Demonstrate Casting procedure in the lab	C2 C2 C2 C2 S1			Lecture Lecture Lecture Practical	MCQs SEQs Vivas OSPE Assignments

Investments

Learning Outcomes	Learning Objectives	Learning Domains			Mode of Information Transfer (MIT)	Assessment Tools
		Knowledge	Skill	Attitude		
Relate chemistry and properties of investment materials to relevant clinical procedures.	Classify investment materials used in dentistry. Describe the composition, setting reaction and properties of different type of investment materials used in dentistry. Identify different types of investment materials.	C2 C2 C1			Lecture Lecture Lecture	MCQs SEQs Vivas OSPE Assignments

Cutting, Grinding, Finishing and Polishing Materials

Learning Outcomes	Learning Objectives	Learning Domains			Mode of Information Transfer (MIT)	Assessment Tools
		Knowledge	Skill	Attitude		
Introduction	Explain benefits of finishing and polishing restorative materials in dentistry	C2			Lecture	MCQs SEQs Vivas OSPE Assignments
Principles of cutting and grinding	Explain the principles of cutting, grinding, finishing and polishing processes. Discuss abrasion and erosion in detail and the hardness of abrasives used List the types of abrasives used Describe Dentifrices and their composition.	C2 C2 C1 C2			Lecture SGD SDL Lecture	

Impression Materials

Learning Outcomes	Learning Objectives	Learning Domains			Mode of Information Transfer (MIT)	Assessment Tools
		Knowledge	Skill	Attitude		
Introduction	Discuss the significance of impression materials in dentistry. Enlist the ideal requirements of Impression materials.	C2 C1			Interactive Lecture Lecture	MCQs SEQs Vivas OSPE Assignments
Setting characteristics and properties	Classify impression materials according to their properties and characteristics Discuss the properties of elastic and non-elastic Impression materials Comparison of Properties & Clinical application of different types of Impression materials. Describe the concept of Digital Impressions to fabricate and mill restorations in single chair	C2 C2 C3			Lecture SGD PBL	

	side appointment	C2			Interactive Lecture/Videos	
Manipulation and Clinical Handling	Perform mixing and handling of Alginate Impression materials Manipulation and handling of Impression Compound techniques Manipulation of elastomeric impression materials	S2 S2 S2			Practical Practical Practical	

Waxes

Learning Outcomes	Learning Objectives	Learning Domains			Mode of Information Transfer (MIT)	Assessment Tools
		Knowledge	Skill	Attitude		
Relate chemistry and properties of waxes to relevant clinical procedures.	Classify types of waxes used in dentistry. Describe the composition based properties and uses of different types of dental waxes. Identify different types of dental waxes e.g. Sticky, Ortho, Inlay, Modelling and Carding wax. Manipulate Modelling wax, inlay wax	C2 C2 C2 S2			Lecture Lecture Presentations Practical	MCQs SEQs Vivas OSPE Assignments

Gypsum Products

Learning Outcomes	Learning Objectives	Learning Domains			Mode of Information Transfer (MIT)	Assessment Tools
		Knowledge	Skill	Attitude		
Introduction	Describe the methods of manufacturing of gypsum	C2			Lecture	MCQs SEQs Vivas OSPE Assignments
	Classify gypsum products.	C2			Lecture	
Setting characteristics and properties	Describe the setting reaction of Gypsum products.	C2			Interactive Lecture	
	Explain the factors affecting setting time.	C2			Lecture	
	Discuss the physical and mechanical properties of gypsum products.	C2			SGD	
	Describe methods to test setting of gypsum and disinfection of gypsum models and study cast.	C2			SDL	
	Explain Expansion of gypsum products & control of setting expansion	C2			Interactive Lecture	

Mixing and Manipulation	Perform the mixing of Gypsum powder in the correct powder/liquid ratio Make plaster slabs with the correct dimensions		S2 S2		Practical Practical	

Endodontic Materials

Learning Outcomes	Learning Objectives	Learning Domains			Mode of Information Transfer (MIT)	Assessment Tools
		Knowledge	Skill	Attitude		
Endodontic Materials	Enlist the steps involved in Root Canal Treatment. Discuss the types and clinical aspects of Root Canal Obturating materials and Root canal Sealers. Explain about the types, indication and mode of action of Intra Canal Medicaments in Endodontic. Describe the types and indication of Intra Canal Irrigants. Describe the role of	C1 C2 C2 C2			Presentations Lecture Lecture Lecture	MCQs SEQs Vivas OSPE Assignments

	conventional and advanced Pulp Capping Agents. (Calcium Hydroxide, MTA and Bio dentine) Enlist Endodontic Solvents for removal of Obturating materials. (xylol, orange oil, chloroform, halothane, rectified turpentine, eucalyptus)	C2 C1			Lecture SDL	

Biocompatibility

Learning Outcomes	Learning Objectives	Learning Domains			Mode of Information Transfer (MIT)	Assessment Tools
		Knowledge	Skill	Attitude		
Biocompatibility	Define the term Biocompatibility and the factors affecting the biocompatibility of dental materials Discuss the adverse effects from dental materials including local and systemic effects. Describe the tests used to	C1 C2			Lecture SGD	MCQs SEQs Vivas OSPE Assignments

	measure biocompatability. Describe the guidelines for selecting biocompatible materials.	C2 C2			Lecture Lecture	

Table of specifications for Dental Materials Theory Examination 2nd Year BDS

TABLE OF SPECIFICATIONS (TOS)

Sr	Contents	SEQs	MCQs
1	Physical properties of Dental Materials/ Thermal Properties	1	2
	Mechanical Properties of Dental Materials		
2	Impression Materials	1	5
3	Gypsum Products	1	2
4	Dental Waxes	1	1
5	Casting Investments	1	2
6	Abrasive and Polishing Materials	1	2
7	Polymers / Denture Base Resins	1	3
8	Dental Ceramics	1	4
9	Adhesion / Bonding	1	4
	Restorative Resins / Composites		
10	Dental Cements	1	4
11	Glass ionomers	1	4
12	Dental Amalgams	1	3
13	Direct Filling Gold	1	1
14	Casting Alloys	1	4
15	Soldering / Welding	1	4
	Wrought Alloys		
	Dental Implant Materials		
	TOTAL	**15**	**45**

Table of specifications for Dental Materials oral & practical 2nd Professional examination

Oral and Practical Examination carries 200 marks

Examination Component	Marks
A- Internal Assessment	20
B- Theory • SEQs: 15 (03 marks each) • MCQs: 45 (01 marks each)	90
C- Viva voce a. External examiner: 25 Marks b. Internal Examiner: 25 Marks	50
D- OSPE a. Observed stations: There are 5 observed stations; 5 marks for each station – Manipulation and mixing of materials willobserved station) b. Non-observed stations: There are five non-observed stations; 3 marks for each station – time allowed is 2 minutes for each non-observed station	40

Evaluation and Feedback

Internal Assessment (20 Marks)

Based on written tests (60%), OSPE and Viva (30%) and Assignments (10%).

Written Tests will be conducted at the end of each course. Tests will comprise of Multiple Choice Question (MCQs) and Short Essay-type Questions (SEQs).

Practical Sessions will be conducted after each topic.

Teaching Assignments for students for each topic.

Viva and Objective Structured Practical Examination (OSPE): 30 Marks

Send-up Examination: 2 Hours 15 minutes' duration. UHS Pattern examination. (MCQs and SEQs), Viva-voce

Professional Examination by the UHS: 200 Marks
Theory 90 Marks (15 SEQs 03 Marks each, 45 MCQs 01 mark each),
Viva-voce and OSPE: 90 Marks
Internal Assessment 20 Marks
Format for OSPE BDS Dental Materials
Marks will be divided as per the following formula:

Structured Viva-Voce	50 Marks 25 with Internal & 25 with External Examiner
OSPE -- 10 Stations	40 Marks (02 minutes each)

4. ACADEMIC CALENDAR 2024

DATE	DAY	Topics	Facilitator
11-Mar-24	Monday		
12-Mar-24	Tuesday	Introduction to Dental Materials	Dr Usman Mahmood/Dr Fatima Suhaib
13-Mar-24	Wednesday	Physical properties (Thermal properties)	Dr Usman Mahmood
14-Mar-24	Thursday	Physical properties (Electrochemical properties)	Dr Usman Mahmood
15-Mar-24	Friday	Mechanical properties	Dr Omair Anjum
16-Mar-24	Saturday		
17-Mar-24	Sunday		
18-Mar-24	Monday		
19-Mar-24	Tuesday	Mechanical properties	Dr Omair Anjum
20-Mar-24	Wednesday	Mechanical properties	Dr Omair Anjum
21-Mar-24	Thursday	Introduction to Impression Materials	Dr Usman Mahmood
22-Mar-24	Friday	TEST 1 (Physical & Mechanical Properties)	Dr Usman Mahmood
23-Mar-24	Saturday		
24-Mar-24	Sunday		
25-Mar-24	Monday		
26-Mar-24	Tuesday	Test Discussion	Dr Fatima Suhaib
27-Mar-24	Wednesday	Non-Elastic Impression Materials	Dr Usman Mahmood
28-Mar-24	Thursday	Impression Compound	Dr Usman Mahmood/Dr Fatima Suhaib
29-Mar-24	Friday	Disinfection of Impressions	Dr Fatima Suhaib
30-Mar-24	Saturday		
31-Mar-24	Sunday		
1-Apr-24	Monday		
2-Apr-24	Tuesday	Elastic Impression Materials	Dr Usman Mahmood
3-Apr-24	Wednesday	Impression Materials	Dr Usman Mahmood/Dr Fatima Suhaib
4-Apr-24	Thursday	Alginate Impression Material	Dr Omair Anjum
5-Apr-24	Friday	Gypsum	Dr Omair Anjum
6-Apr-24	Saturday		

7-Apr-24	Sunday		
8-Apr-24	Monday		
9-Apr-24	Tuesday	Gypsum	Dr Omair Anjum/Dr Fatima Suhaib
10-Apr-24	Wednesday	**EID HOLIDAYS**	
11-Apr-24	Thursday	**EID HOLIDAYS**	
12-Apr-24	Friday	**EID HOLIDAYS**	
13-Apr-24	Saturday		
14-Apr-24	Sunday		
15-Apr-24	Monday		
16-Apr-24	Tuesday	Introduction to Dental Amalgam	Dr Usman Mahmood
17-Apr-24	Wednesday	Dental Amalgam	Dr Usman Mahmood
18-Apr-24	Thursday	Dental Amalgam	Dr Usman Mahmood
19-Apr-24	Friday	Dental Amalgam	Dr Usman Mahmood
20-Apr-24	Saturday		
21-Apr-24	Sunday		
22-Apr-24	Monday		
23-Apr-24	Tuesday	Dental Amalgam Mixing Tutorial	Dr Usman Mahmood
24-Apr-24	Wednesday	Mercury Toxicity	Dr Fatima Suhaib
25-Apr-24	Thursday	Introduction to bonding agent	Dr omair anjum
26-Apr-24	Friday	Bonding agent:Generations	Dr oamir anjum /Dr fatima suhaib
27-Apr-24	Saturday		
28-Apr-24	Sunday		
29-Apr-24	Monday		
30-Apr-24	Tuesday	Composite Resin	Dr omair anjum
1-May-24	Wednesday	Labour Day	
2-May-24	Thursday	Bonding agents+Gypsum revision	Dr omair anjum
3-May-24	Friday	Composite resin	Dr Usman Mahmood
4-May-24	Saturday		
5-May-24	Sunday		
6-May-24	Monday		
7-May-24	Tuesday	Composite Resin	Dr Usman Mahmood
8-May-24	Wednesday	Composite Resin	Dr Usman Mahmood
9-May-24	Thursday	Impression Materials Revision	Dr Fatima Suhaib
10-May-24	Friday	Impression Materials Revision	Dr Fatima Suhaib
11-May-24	Saturday		
12-May-24	Sunday		
13-May-24	Monday		
14-May-24	Tuesday	Test 2:Impression materials,amalgam,Bonding agents and composites	Dr Usman Mahmood

15-May-24	**Wednesday**	**Test 2:Impression materials,amalgam,Bonding agents and composites**	**Dr Usman Mahmood**
16-May-24	**Thursday**	**Test 2:Impression materials,amalgam,Bonding agents and composites**	**Dr Usman Mahmood**
17-May-24	**Friday**	**Composite resin revision**	**Dr Usman Mahmood**
18-May-24	**Saturday**		
19-May-24	**Sunday**		
20-May-24	**Monday**		
21-May-24	**Tuesday**	**Introduction to GIC**	**Dr Omair Anjum/Dr Fatima Suhaib**
22-May-24	**Wednesday**	**GIC modifications**	**Dr Omair Anjum**
23-May-24	**Thursday**	**GIC**	**Dr Omair Anjum**
24-May-24	**Friday**	**GIC Revision**	**Dr Omair Anjum**
25-May-24	**Saturday**		
26-May-24	**Sunday**		
27-May-24	**Monday**		
28-May-24	**Tuesday**	**Cement**	**Dr usman Mahmood**
29-May-24	**Wednesday**	**Cement**	**Dr usman Mahmood**
30-May-24	**Thursday**	**Cement**	**Dr Usman Mahmood/Dr Fatima Suhaib**
31-May-24	**Friday**	**Cement Revision**	**Dr Fatima Suhaib**
1-Jun-24	**Saturday**		
2-Jun-24	**Sunday**		
3-Jun-24	**Monday**		
4-Jun-24	**Tuesday**	**Introduction to Casting**	**Dr Usman Mahmood**
5-Jun-24	**Wednesday**	**Casting**	**Dr Usman Mahmood**
6-Jun-24	**Thursday**	**Casting**	**Dr Usman Mahmood/Dr Fatima Suhaib**
7-Jun-24	**Friday**	**Gypsum Bonding Investing Materials**	**Dr Usman Mahmood**
8-Jun-24	**Saturday**		
9-Jun-24	**Sunday**		
10-Jun-24	**Monday**		
11-Jun-24	**Tuesday**	**Introduction to Metals**	**Dr usman mahmood**
12-Jun-24	**Wednesday**	**Base metal alloys**	**Dr usman mahmood**
13-Jun-24	**Thursday**	**Base metal alloys**	**Dr Usman Mahmood/Dr Fatima Suhaib**
14-Jun-24	**Friday**	**Impression Materials Revision**	**Dr Usman Mahmood**
15-Jun-24	**Saturday**		
16-Jun-24	**Sunday**	**SUMMER VACATIONS**	
17-Jun-24	**Monday**	**SUMMER VACATIONS**	
18-Jun-24	**Tuesday**	**SUMMER VACATIONS**	
19-Jun-24	**Wednesday**	**SUMMER VACATIONS**	
20-Jun-24	**Thursday**	**SUMMER VACATIONS**	
21-Jun-24	**Friday**	**SUMMER VACATIONS**	

22-Jun-24	Saturday	SUMMER VACATIONS	
23-Jun-24	Sunday	SUMMER VACATIONS	
24-Jun-24	Monday	SUMMER VACATIONS	
25-Jun-24	Tuesday	SUMMER VACATIONS	
26-Jun-24	Wednesday	SUMMER VACATIONS	
27-Jun-24	Thursday	SUMMER VACATIONS	
28-Jun-24	Friday	SUMMER VACATIONS	
29-Jun-24	Saturday	SUMMER VACATIONS	
30-Jun-24	Sunday	SUMMER VACATIONS	
1-Jul-24	Monday	SUMMER VACATIONS	
2-Jul-24	Tuesday	SUMMER VACATIONS	
3-Jul-24	Wednesday	SUMMER VACATIONS	
4-Jul-24	Thursday	SUMMER VACATIONS	
5-Jul-24	Friday	SUMMER VACATIONS	
6-Jul-24	Saturday	SUMMER VACATIONS	
7-Jul-24	Sunday	SUMMER VACATIONS	
8-Jul-24	Monday	SUMMER VACATIONS	
9-Jul-24	Tuesday	SUMMER VACATIONS	
10-Jul-24	Wednesday	SUMMER VACATIONS	
11-Jul-24	Thursday	SUMMER VACATIONS	
12-Jul-24	Friday	SUMMER VACATIONS	
13-Jul-24	Saturday	SUMMER VACATIONS	
14-Jul-24	Sunday	SUMMER VACATIONS	
15-Jul-24	Monday	SUMMER VACATIONS	
16-Jul-24	Tuesday	SUMMER VACATIONS	
17-Jul-24	Wednesday	Ashura Holiday	
18-Jul-24	Thursday	Casting Alloy	Dr Omair Anjum
19-Jul-24	Friday	Casting Alloy	Dr Omair Anjum
20-Jul-24	Saturday		
21-Jul-24	Sunday		
22-Jul-24	Monday		
23-Jul-24	Tuesday	Casting metal Alloys/Research topic discussion	Dr Omair Anjum/Dr Fatima Suhaib
24-Jul-24	Wednesday	GIC Revision	Dr Fatima Suhaib
25-Jul-24	Thursday	Amalgam Revision	Dr Usman Mahmood
26-Jul-24	Friday	Test:Amalgam,GIC,Composite and cement	Dr Usman Mahmood
27-Jul-24	Saturday		
28-Jul-24	Sunday		
29-Jul-24	Monday		
30-Jul-24	Tuesday	Wrought Alloys	Dr Usman Mahmood
31-Jul-24	Wednesday	Wrought Alloys	Dr Omair Anjum/Dr Fatima Suhaib
1-Aug-24	Thursday	Wrought Aloy Revision	Dr usman Mahmood

2-Aug-24	**Friday**	**Presentation research/Topic allotment**	**Dr Fatima Suhaib**
3-Aug-24	**Saturday**		
4-Aug-24	**Sunday**		
5-Aug-24	**Monday**		
6-Aug-24	**Tuesday**	**Casting Alloy**	**Dr omair anjum**
7-Aug-24	**Wednesday**	**Ceramics**	**Dr omair Anjum**
8-Aug-24	**Thursday**	**Ceramics**	**Dr omair Anjum**
9-Aug-24	**Friday**	**Investing materials**	**Dr Fatima Suhaib**
10-Aug-24	**Saturday**		
11-Aug-24	**Sunday**		
12-Aug-24	**Monday**		
13-Aug-24	**Tuesday**	**Test:Ceramics And Metals**	**Dr usman Mahmood**
14-Aug-24	**Wednesday**	**Small Group Discussion**	**Dr usman Mahmood**
15-Aug-24	**Thursday**	**Small Group Discussion**	**Dr omair anjum**
16-Aug-24	**Friday**	**Small Group Discussion**	**Dr Fatima Suhaib**
17-Aug-24	**Saturday**		
18-Aug-24	**Sunday**		
19-Aug-24	**Monday**		
20-Aug-24	**Tuesday**	**Polymers**	**Dr omair anjum**
21-Aug-24	**Wednesday**	**Research Discussion**	**Dr Fatima Suhaib**
22-Aug-24	**Thursday**	**Research Discussion**	**Dr Fatima Suhaib**
23-Aug-24	**Friday**	**Revision And Small Goup discussion**	**Dr usman Mahmood**
24-Aug-24	**Saturday**		
25-Aug-24	**Sunday**		
26-Aug-24	**Monday**		
27-Aug-24	**Tuesday**	**Research Discussion**	**Dr Fatima Suhaib**
28-Aug-24	**Wednesday**	**Research Discussion**	**Dr Fatima Suhaib**
29-Aug-24	**Thursday**	**Implants**	**Dr Fatima Suhaib**
30-Aug-24	**Friday**	**Finishing and polishing**	**Dr Omair Anjum/Dr Fatima Suhaib**
31-Aug-24	**Saturday**		
1-Sep-24	**Sunday**		
2-Sep-24	**Monday**		
3-Sep-24	**Tuesday**	**Endodontic Materials**	**Dr Fatima Suhaib**
4-Sep-24	**Wednesday**	**REVISION**	**Dr Fatima Suhaib**
5-Sep-24	**Thursday**	**REVISION**	**Dr Usman Mahmood**
6-Sep-24	**Friday**	**REVISION**	**Dr Omair Anjum**
7-Sep-24	**Saturday**		
8-Sep-24	**Sunday**		
9-Sep-24	**Monday**		
10-Sep-24	**Tuesday**	**Revision And Small Goup discussion**	**Dr Usman Mahmood/Dr Fatima Suhaib**
11-Sep-24	**Wednesday**	**Revision And Small Goup discussion**	**Dr Omair Anjum/Dr Fatima Suhaib**
12-Sep-24	**Thursday**	**Revision And Small Goup discussion**	**Dr Fatima Suhaib**

13-Sep-24	Friday	Small Group Discussion	Dr Fatima Suhaib
14-Sep-24	Saturday		
15-Sep-24	Sunday		
16-Sep-24	Monday		
17-Sep-24	Tuesday	Research Presentation	Dr Usman Mahmood
18-Sep-24	Wednesday	Research Presentation	Dr Usman Mahmood
19-Sep-24	Thursday	Final Presentation	Dr Usman Mahmood
20-Sep-24	Friday	Revision	Dr Fatima Suhaib

Allocation of hours, No. of Lectures/ activities
Large group teaching

Topics	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Total
Physical Properties		3	2							5
Mechanical Properties		5								5
Gypsum			4							4
Waxes			2							2
Investments and Refractory Dies		3								3
Metals and Alloys							10	8	2	20
Ceramics							7			7
Polymers					4	5				9
Impression Materials			5	5	1					11
Dental Amalgam				5	1					6
Dental Composites				4	4					8
Bonding				3						3
GIC						3	1			4
Cements					4					4
Endodontic Materials								2		2
Total		11	22	21	6	3	18	10	2	93

Color coding	
Prof. Dr. Usman Mahmood	
Dr Omair Anjum	
Dr. Fatima Suhaib	

Small group teaching

Sr. No	Activities	No. of weeks	Facilitators	Supervisors
1	Practicals (every week: 150 minutes)	36	Dr Shehryar Dr Mehak Hasnain	Prof. Dr Usman Mahmood Dr Omair Anjum Dr Fatima Suhaib
2	Tutorials (every week: 60 minutes)	36	Dr Shehryar Dr Mehak Hasnain	Prof. Dr Usman Mahmood Dr Omair Anjum Dr Fatima Suhaib

TEST / EXAM PLANNER					
TEST	**Date / Week**	**THEORY**			**SYLLABUS**
		MARKS	**NO OF MCQs**	**NO OF SEQs**	
1	26/04/2024 Week 9	30	15	3	Properties and Impression Materials
2	24/05/2024 Week 13	30	15	3	Gypsum, Investments, Polymers
3	26/07/2024 Week 22	50	30	5	Midterm Theory
4	23/8/24 Week 25	50	OSPE & VIVA VOCE		Course covered so far
5	27/09/2024 Week 29	50	30	5	Restorative Materials, Cements
6	25/10/2024 Week 33	100	45	15	Send up Exam Theory and Viva Presentations (10 marks)

5. Dental Materials Time Table

MONDAY	**—**	
TUESDAY	**12:30 – 1:20** **Lecture Theatre 5**	
WEDNESDAY	**12:30am - 1:20pm**	**1:20pm - 3:00pm**
	Lecture Theatre 5	**Lecture Theatre 5/ Dental Materials lab**
THURSDAY	**11:50am - 12:30pm**	**12:30-1:20** **Lecture Theatre 5**
	Lecture Theatre 5	
FRIDAY	**8:00am - 10:30am**	**—**
	Dental Materials Lab	

6. TEACHING AND LEARNING METHODOLOGIES

a. Large group teaching strategies
   - Lectures
   - Interactive sessions

b. Small group teaching strategies:
   - Employed during practical's (weekly) and tutorials (weekly)
   - Interactive sessions
   - Small group discussions (SGDs)
   - Take home assignments
   - SEQ and MCQ exercises
   - Viva voce
   - Presentations by students
   - Laboratory demonstrations and practical's

7. RECOMMENDED TEXTBOOKS:

- Restorative Dental materials by Robert. Craig
- Notes on dental materials by Shahina Nusrat
- Clinical Handling of Dental Materials by B.N Smith
- Notes on Dental Materials by E.C.Combe
- Dental Chemistry by Cunnigham
- Philips Science of Dental Materials
- McCabe Applied Dental Materials

8. ASSESSMENT FORMATS

All assessments are meticulously planned in collaboration with other concerned departments to avoid clustering/overlapping and schedule is given to the students in advance. At least one dental materials test is conducted each month. Topics included in each test are notified and resources are identified.

a. Written tests

Written class tests include MCQs (one best type) and SEQs. University recommendations for marks distribution are strictly followed.

b. Oral examination

In order to prepare the students for oral component of university examination, viva voce examinations (by senior faculty members) are also conducted during the session.

c. Send up examination

Send up is a comprehensive examination including whole dental materials course that is conducted at the end of academic session and final university examination pattern is followed in every respect (no. of questions, ToS, marks distribution, total time allowed etc.).

9. ONLINE TEACHING

During covid-19 pandemic, teaching was continued online for 2nd year BDS. Online time tables were formulated by consensus of all the concerned departments. Students, faculty and concerned staff was optimally trained and facilitated by IT and DME. Lectures and tutorials were held using Google meet and Microsoft teams. Class tests were conducted in Google class room. Assignments, hand-outs, and other necessary information were shared on web portal of LMDC, Google class room and Microsoft teams. Online viva was conducted using zoom software program. Online attendance record was meticulously maintained and added to the total record.

In case of lockdown, similar strategies would be employed for both synchronous and asynchronous e-learning program.

10. ROBUST FEEDBACK SYSTEMS

a. Feedback on attendance

Attendance report is forwarded to students and parents on daily basis through the LMDC web portal

b. Feedback on academic performance

Academic performance report is also regularly forwarded to students and parents. Moreover, individual students are given feedback on their academic performance during tutorials. MCQ and SEQ papers are also discussed with students in small groups.

b. Parents of weak students are regularly contacted (PTM sessions)

11. COUNSELING FACILITIES FOR STUDENTS

a. Senior faculty members of dental materials department are actively involved in resolving academic and non-academic issues of allocated students (PTS sessions)
b. Individual students are also referred to the student counselor, if needed

12. SUMMER VACATIONS AND REMEDIAL CLASSES

Summer vacations= 4 weeks

Remedial classes are mandatory for students who:

a. Join late
b. Have poor attendance/test performance or both in term I