



Women Dental College, Abbottabad

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STUDY GUIDE 2nd Year BDS Department of Dental Materials

Description: The science of dental materials involves a study of the composition and properties of materials and the way in which they interact with the environment in which they are placed.

Overview: The selection of materials for any given application can thus be undertaken with confidence and sound judgment.

Program	Bachelor of Dental Surgery
Course Name	Science of Dental Materials
Contact Hours	250
Infrastructure Requirements	Lecture Hall Museum Plaster Laboratory

Faculty Responsible for Course Conduction:

Sr. No	Faculty	Designation
01	Dr. Bilal Zaman Babar BDS, MSc	HOD & Associate Professor
02	Dr. Asma Rashid BDS, M.Phil	Lecturer
03	Dr. Spogmay Jahangir BDS	Lecturer



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Details of Supporting Staff:

Sr. No	Staff	Designation
01	Mr. Irshad Ahmad	Lab Technician

Objectives & Learning Strategies/TOS:

All LGF's are taken by **Dr. Bilal Zaman Babar** (Associate Professor)

S.N o.	Topic	Learning Outcomes	Teaching Hours	Learning site	Mode of Teaching and Tools	Assessment Tools	Level of Questions
01	Science of Dental Materials	Introduction, Selection of materials	1	Lecture Room	LGF, PPT/ White board	MCQs, SEQs,	C1
02	Properties	Introduction, Mechanical properties, Thermal properties, Chemical properties	5	Lecture Room	LGF, PPT and White board	MCQs, SEQs, Oral Viva	C1
03	Gypsum Products for dental casts	Introduction, Requirements of dental cast materials, composition, manipulation	3	Lecture Room	LGF, PPT and White Board	MCQs, SEQs, Oral Viva	C1
04	waxes	Introduction, requirements of wax pattern materials, composition of	3	Lecture Room	LGF, PPT and White board	MCQs, SEQs, Oral Viva	C2



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		waxes, Properties					
05	Investment and refractory dies	Introduction, requirements of investment for alloy casting procedures, Applications	3	Lecture Room	LGF, PPT and White board	MCQs, SEQs and Oral Viva	C1
06	Metals and alloys	Introduction, structure and properties of metals, cooling curves, phase diagrams	11	Lecture Room	LGF, PPT and White board	SEQs, MCQs AND Oral Viva	C2
07	Gold and alloys of noble metals	Introduction, pure gold fillings, hardening heat treatments, heat treatments					
08	Base metal casting alloys	Introduction, composition, manipulation,, properties					
09	Steel and Wrought Alloys	Introduction, Stainless steel, wires					
10	casting	Introduction, investment mould, casting machines	3	Lecture Room	LGF, PPT and White board	MCQs, SEQs and Oral Viva	C1
11	Ceramics and porcelain fused to metals	Introduction, composition, compaction, properties, sintered alumina cores, CAD-CAM,, sintered alumina core	3	Lecture Room	LGF, PPT and White Board	MCQs, SEQs and Oral Viva	C2
12	Synthetic polymers	Introduction, polymerization , structure and properties, methods	2	Lecture Room	LGF, PPT and White board	MCQs, SEQs and Oral Viva	C2



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13	Denture base polymers	Introduction, requirements, alternative polymers	2	Lecture Room	LGF, PPT and White board	MCQs, SEQs and Oral Viva	C2
14	Denture lining materials	Introduction, hard reline materials, tissue conditioners	2	Lecture Room	LGF, PPT and White Board	MCQs, SEQs and Oral Viva	C1
15	Artificial teeth	Introduction, requirements, properties	1	Lecture Room	LGF, PPT and White Board	MCQs, SEQs and Oral Viva	C1
16	Impression materials	Introduction, classification, requirements	3	Lecture Room	LGF, PPT and White Board	MCQs and Oral Viva	C1
17	Non elastic impression materials	Introduction, impression plaster, impression compound, impression waxes, zinc oxide eugenol	2	Lecture Room	LGF, PPT	MCQs, SEQs and Oral Viva	C2
18	Elastic impression materials, hydrocolloids	Introduction, agar, alginate, modified alginates	2	Lecture Room	LGF, PPT	MCQs, SEQs and Oral Viva	C2
19	Elastic impression materials, synthetic elastomers	Polysulphides, condensation silicones, addition silicones, polyether, comparison and properties	5	Lecture Room	LGF, PPT	MCQs, SEQs and Oral Viva	C2
20	Requirements of direct filling materials	Introduction, appearance, chemical, thermal properties, adhesion	1	Lecture Room	LGF	SEQs	C1
21	Dental amalgam	Composition, setting reaction, properties, clinical handling	3	Lecture Room	LGF, PPT and White Board	MCQs, SEQs and Oral Viva	C2



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22	Resin based filling materials	Classification, composition, fiber reinforced composites	5	Lecture Room	LGF, PPT and White Board	MCQ, SEQs and Oral Viva	C2
23	Adhesive restorative materials	Acid etch system, bonding to dentine, primers and bonding, bond strength and leakage					
24	Glass ionomer restorative materials	Composition, setting reaction, cements, application	3	Lecture Room	LGF, PPT and White Board	MCQs, SEQs and Oral Viva	C1
25	Resin modified glass ionomer cements	Introduction, composition, classification, adhesive characteristics, setting reaction	1	Lecture Room	LGF, PPT	MCQs and Oral Viva	C1
26	Temporary crown and bridge resin	Introduction, requirements, properties	5	Lecture Room	LGF, PPT	MCQs, SEQs and Oral Viva	C1
27	Requirements of dental cements	Requirements of cavity lining, luting, endodontic and orthodontic cements.					
28	Cements based on phosphoric acid	Zinc phosphate cements, silicophosphate cements, copper cements					
29	Cements based on organometallic chelate compounds	Zinc oxide eugenol cements, EBA cements, calcium hydroxide cements					
30	Polycarboxyl	Polycarboxylat					



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	ate cements, glass ionomer and resin modified glass ionomers	e cements, RMGIC, GIC					
31	Endodontic materials	Irrigants, Intra canal medicaments, Obturating materials, Historical materials, Clinical Handling					
32	Abrasion and Polishing materials	Classification, Composition Properties, Applications	6	Lecture Room	LGF, PPT	MCQs, SEQs and Oral Viva	C1
33	Perform Wire Bending Techniques	Wire Bending Techniques	17	Plaster Laboratory	Demonstration	OSPE and Oral Viva	P2
34	Manipulate the following Impression materials. Impression Compound, Alginate, Silicon	Impression materials. Impression Compound, Alginate, Silicon	16	Plaster Laboratory	Demonstration	OSPE and Oral Viva	P1
35	Make a Rectangular Slab of Plaster of Paris	Rectangular Slab of Plaster of Paris	7	Plaster Laboratory	Demonstration	OSPE and Oral Viva	P2
36	Construct the Removable Partial Dentures on mould (Anterior)	Removable Partial Dentures on mould (Anterior)	57	Plaster Laboratory	Demonstration	OSPE and Oral Viva	P2
37	Perform the Mixing of the following paste Zinc oxide Eugenol	Mixing of the following paste Zinc oxide Eugenol cement, Dental	14	Plaster Laboratory	Demonstration	Oral Viva	P1



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	cement, Dental Amalgam, GIC and Zinc phosphate cement	Amalgam, GIC, Zinc phosphate cement					
38	Construct the Removable Partial Dentures on a mold (Posterior)	Removable Partial Dentures on a mold (posterior)	56	Plaster Room	Demonstration	Oral Viva	P2

All Practical sessions are taken by Lecturers: **Dr. Asma** and **Dr. Spogmay**

Learning Resources:

Sr.No	Text/ Reference Books	Edition
01	McCabe (Text Book)	16 th
02	Philips (Reference Book)	13 th

Additional Learning Resources:

Hands on	In the Plaster Room by Mixing Soft plaster, Hard plaster, Making Plaster Slab, Manufacturing Anterior and Posterior Partial Denture.
Skills Lab	Wire Bending/Making Wire Alphabets
Videos	https://www.youtube.com/watch?v=ls3c69AiJa0 https://www.youtube.com/watch?v=STNhWioVLW4 https://www.youtube.com/watch?v=N2Eg5wXkSj8 https://www.youtube.com/watch?v=JoLle6oE9sw
Internet Resources	Google chrome



Assessment Methods:

MCQs:

Multiple Choice questions; Single best Type

OSPE: Objective Structured Practical Examination

Oral Viva:

Presentation:

Multiple Choice Questions:

1. Single best type MCQs having five options with one correct answer and four distractors are part of assessment.
2. Correct answer carries one mark, and incorrect will be marked zero. Negative marking is not applicable.
3. Students mark their responses on specified computer-based designed sheet.

Objective Structured Practical Examination

1. Nine OSPE stations are used for formative as well as summative assessment.
2. Time allocated for each station is five minutes as per Examination rules of Khyber Medical University, Peshawar.
3. All students are rotated through the same stations.
4. Stations used are un-observed, observed/Interactive and Rest stations.
5. On unobserved stations, models, lab reports, radiographs, flowcharts, case scenarios may be used to assess cognitive domain.
6. On observed station, examiners don't interact with candidate and just observe the performance of skills /procedures.
7. On interactive station, examiner asks questions related to the task within the allocated time.
8. On rest station, students are not given any task. They just wait to move to the



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next station.

Presentation:

Students are given topics for presentation either individually or in groups. They are encouraged to prepare presentations on power point to enhance their understanding of the topic.

Internal Assessment Criteria:

1. 10% weightage of Internal Assessment in professional exam is policy of Khyber Medical University.
2. This Internal Assessment will comprise of following components
 - a) Attendance
 - b) Class presentations
 - c) Monthly tests
 - d) Midterms
 - e) Pre-Prof

Examination Rules & Regulations:

1. One class test of the subject may be held monthly, marks of which will be included in internal assessment. Marks for class test can vary according to syllabus and teachers' choice.
2. Mid-Term exam comprising 45 MCQs of single best type and 45 marks SEQs will be held in the middle of the session.
3. Pre-prof Exam comprising 45 MCQs of single best type and 45 marks SEQs will be conducted at the end of session before prep leaves.
4. The pattern of class tests, Mid-term & Pre-prof will be same as the Professional Exam taken by Khyber Medical University, Peshawar.
5. OSPEs will be conducted at the end of Mid-term & pre-prof Exam.



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Feedback on Examination:

1. Students' feedback on assessment strategies will be taken in a preformed proforma for feedback twice a year i.e., Mid-term and pre-prof exams.
2. Feedback of theory as well as OSPE & Viva will be taken.
3. Department of Medical Education & Quality Enhancement Cell in collaboration with Exam Cell of WDC is responsible to conduct this exercise.

Model Questions:

Multiple Choice Question

Question: 1.

Which Dental cement releases fluoride and has anti cariogenic properties?

- A. Zinc phosphate cements
- B. Zinc oxide eugenol cements
- C. Calcium hydroxide cements
- D. Glass ionomer cements
- E. Silicophosphate cements

Answer Key

Key. D

Sources:

McCab 16th Edition



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Short Answer Question:

Q. No.1.

(a). Describe the sandwich technique? (2)

Ans:

(b). Describe the use of composite resin and glass ionomer cement for restoration of class II cavity. (3)

Ans:

Suggestions for Next Academic Year:

Student's Power Point Presentation encouragement

Bridging the gap in 2nd year dental material curriculum

Include Dental research themes in the curriculum

The use of Feedback in teaching undergraduate dental school students

The Impact of innovative approach of teaching

Dental materials applied to 3D and 4D Printing Technologies

Clinical Aspects of Dental materials

Recommended infection control practices for Dentistry

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HOD and Associate Professor

Dental materials

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