

**Course: Restorative dental medicine**

**Course Coordinator: Prof. Alen Braut, PhD, DMD**

**Department: Endodontics and restorative dentistry**

**Study program: Integrated Undergraduate and Graduate University Study of Dental Medicine in English**

**Study year: 3<sup>rd</sup>**

**Academic year: 2023 / 2024.**

## **SYLLABUS**

**Course description (a brief description of the course, general instructions, where and in what form the lessons are organized, necessary equipment, instructions for attendance and preparation for classes, student obligations, etc.):**

The aim of the course is to acquire basic knowledge and skills in the field of restorative dental medicine. The goal is to familiarize students with materials for temporary and permanent fillings of cavities on hard dental tissues, to show the stages in the formation of cavities on teeth with carious lesions, and to familiarize students with basic and additional instrumentation for cavity formation and fillings. Particular attention is on to the acquisition of students' skills during clinical exercises with the aim of independently performing the assigned practical tasks.

### **Assigned reading:**

Mouth GJ, Hume WR, Ngo HC, Wolff MS. Preservation and restoration of tooth structure. 3rd edition. Wiley Blackwell. 2016.

### **Optional/additional reading:**

Textbook of Operative Dentistry: N.Garg, A.Garg. The Health Sciences Publisher, New Delhi, London, Philadelphia, Panama; 3rd Ed. 2015.

## **COURSE TEACHING PLAN:**

### **The list of lectures (with topics and descriptions):**

- L1.** Introduction to Restorative Dental Medicine. Basic and modern principles of cavity preparation and filling treatment (I and II class)  
Learning outcomes:  
Describe the aim of the restorative dental medicine course  
Describe and name the indication and explain creation of cavities on the occlusal and proximal surfaces of premolars and molars in the permanent dentition.
- L2.** Basic and modern principles of cavity preparation and filling treatment (III, IV and V class)  
Learning outcomes:  
List, describe and explain the indication and creation of cavities on the proximal surfaces of the frontal teeth in the permanent dentition, as well as the vestibular and oral surfaces of all teeth.
- L3.** Principles of adhesive cavity design  
Learning outcomes:  
List, describe and explain the indications and basic principles of creating cavities for aesthetic fillings on all teeth.
- L4.** Applied histology of hard dental tissues  
Learning outcomes:

Define the structure of hard dental tissues and connect the structure on the principles of cavity preparation and the use of dental materials.

**L5.** Dentin wound and preparations for the protection of the pulpo-dentine complex. Temporary restorations

Learning outcomes:

Describe and explain indications for the use of materials for the protection of dentine wounds, temporary closure of cavities, their composition and characteristics.

**L6.** Dental cements (zinc-phosphate, carboxylate, glass-ionomer)

Learning outcomes:

List and describe materials used to replace lost dentine tissue. Describe composition of materials and their preparation and the technique of placing them in the cavity.

**L7.** Glass-ionomer cements I

Learning outcomes:

Explain the basic characteristics of glass ionomer cements. List their indications and the cavity preparation procedure before placing glass ionomer cement in the cavity.

**L8.** Glass-ionomer cements II

Learning outcomes:

Name the basic characteristics of glass ionomer cements. Know their indications and the cavity preparation procedure before placing glass ionomer cement in the cavity.

**L9.** Dental amalgams

Learning outcomes:

Recognize the historical development of amalgam, indications and contraindications.

Interpret the composition and conditions for placing amalgam in the cavity.

**L10.** Composite materials. Composition and application

Learning outcomes:

Recognize the historical development of composites, indications and contraindications.

Interpret the composition and conditions for placing the composite in the cavity.

**L11.** Composite materials. Polymerization lamps

Learning outcomes:

Recognize the historical development of light curing composites, indications and contraindications, polymerization lamps, wave length and activations.

Interpret the composition and conditions for polymerization of the composite in the cavity.

**L12.** Dentin adhesives I

Learning outcomes:

Recognize the historical development of dentine adhesives, indications and contraindications.

Interpret the composition and conditions for placing the adhesive in the cavity.

**L13.** Dentin adhesives II

Learning outcomes:

Differentiate clinical protocols of application of dentine adhesives, indications and contraindications.

Interpret and explain the composition and conditions for placing the adhesive in the cavity.

**L14.** Acute vs chronic and iatrogenic dental trauma

Learning outcomes

Describe and explain diagnosis, etiology and therapy of trauma to hard dental tissues.

#### The list of seminars with descriptions:

**S.1.** Workplace, instruments, dry working field (Eng. Rubber-dum)

Describe and explain work at dental work unit, instruments for examination and diagnostics, cavity processing and the final processing of fillings

**S.2. Basic principles of making class I and II cavities**

Define and explain the basic principles of cavity processing on distal teeth

**S.3. Basic principles of class III and V cavity preparation for amalgam and composite**

Define and explain the basic principles of cavity processing on smooth surfaces

**S.4. Basic principles of class IV and VI cavity preparation**

Name, describe and explain atypical preparations.

**S.5. Dental cements (zinc phosphate, polycarboxylate)**

Name indications, define composition, preparation and placement of substrates in the cavity.

**S.6. Glass-ionomer cements**

Describe, discuss and conclude indications, composition, preparation and placement of SIC.

**S.7. Dental amalgams; interdental matrices, clamps and interdental wedges**

To acquire theoretical knowledge about the indications, composition, preparation and placement of amalgam.

Master the infill placement aids.

**S.8. Adhesive cavity and dentine adhesives**

Name and explain indications, composition, preparation and placement of dentin adhesives.

Explain the principles of cavity preparation for aesthetic fillings.

**S.9. Composite materials and finishing restorations**

Name and explain indications, composition, preparation and installation of composites.

Master the process of finishing composite filling.

**S.10. Acute dental trauma**

To acquire theoretical knowledge about diagnostics and therapeutic procedures for trauma to hard dental tissues.

**The list of practicals with descriptions:**

**PART I**

**P.1. Dental history, patient's consent**

Describe and explain workplace and instruments

Describe and differentiate dental instruments, perform the examination of the patient and record the anamnesis and consent of the patient before the procedure

**P.2. Establishment of a dry working field, rubber dam placement (Kofferdam in German)**

Demonstrate patient preparation before therapeutic procedures, create a dry work area.

**P.3. Preparation of Class I cavity for amalgam**

Perform the procedure on the occlusal surfaces of the distal teeth for amalgam filling.

**P.4. Preparation of class II cavity for amalgam**

Perform the procedure on the proximal surfaces of the distal teeth for amalgam fillings

**P.5. Preparation of class V cavities for amalgam**

Perform the procedure on vestibular surfaces of the distal teeth for amalgam fillings

**P.6. Preparation of II class adhesive cavity**

Perform the procedure on the proximal surfaces of the distal teeth for composite fillings

**P.7. Preparation of III class adhesive cavity**

Perform the procedure on the proximal surfaces of the frontal teeth for composite fillings

**P.8. Placement of cavity liners and bases**

Perform the procedure of preparing and placing the substrate in the cavity.

**P.9. Placement of interdental matrix and matrix holder on models, interdental wedges**

Demonstrate work with auxiliary materials for placing fillings

**P.10. Class I and V amalgam restorations**

Demonstrate placing an amalgam filling in a cavity

**P.11. Class II amalgam restorations**

Demonstrate placing an amalgam filling in a cavity

**P.12. Class II composite restorations**

Demonstrate placing an amalgam filling in a cavity

P.13. Class III composite restorations

Demonstrate placing an amalgam filling in a cavity

P.14. Finishing and polishing of amalgam and composite restorations

Demonstrate placing an amalgam filling in a cavity

P.15 Repeating tasks according to free choice

## **PART II**

**prerequisite for participation is the passed DENAL CARIES exam and Colloquium of RDM Part I**

P.1. First examination, dental status, treatment plan

Perform a clinical examination of the oral cavity, recognize the dental status and analyze a therapy plan

P.2. First examination, dental status, treatment plan

Perform a clinical examination of the oral cavity, recognize the dental status and analyze a therapy plan

P.3. First examination, dental status, treatment plan

Perform a clinical examination of the oral cavity, recognize the dental status and analyze a therapy plan

P.4. Minimally invasive procedures

Explain and analyze the indication and perform minimally invasive procedures on patients.

P.5. Minimally invasive procedures

Explain and analyze the indication and perform minimally invasive procedures on patients.

P.6. Minimally invasive procedures

Explain and analyze the indication and perform minimally invasive procedures on patients.

P.7. Treatment of medium and deep carious lesions

Differentiate diagnosis, plan therapy and perform therapeutic interventions for the treatment of diseases of hard dental tissues.

P.8. Treatment of medium and deep carious lesions

Differentiate diagnosis, plan therapy and perform therapeutic interventions for the treatment of diseases of hard dental tissues.

P.9. Treatment of medium and deep carious lesions

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P.14. Treatment of medium and deep carious lesions

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P.15. Treatment of medium and deep carious lesions

Differentiate diagnosis, plan therapy and perform therapeutic interventions for the treatment of diseases of hard dental tissues.

**Students' obligations:**

Students are obliged to regularly attend, actively participate and complete assignments in all forms of teaching.

**Assessment (exams, description of written / oral / practical exam, the scoring criteria):**

Student evaluation is carried out according to the valid Rulebook on Studies of the University of Rijeka. The students' work will be evaluated during the course and in the final exam. Students are graded using the ECTS (A-F) and numerical system (1-5). Grading in the ECTS system is carried out by absolute distribution.

During the semester and the final exam, students will be able to collect a maximum of 100 grade points (a maximum of 70 grade points during the semester and a maximum of 30 grade points during the final exam).

During the semester, a student can collect a maximum of 70 grade points (Table 1).

Of these, 30 in 3 colloquiums, 10 in seminar work, 30 during exercises with continuous verification of theoretical and practical knowledge.

Colloquia will be held in written form at the end of the V., VI. and VIII. semester.

Positive evaluation of the TERMS taken in V and VI. semester and active participation in classes is a condition for acquiring 4.5 ECTS credits and access to clinical exercises in VII. semester.

Exercise leaders will evaluate theoretical knowledge and practical work on the patient (refers to clinical exercises). The average grade will be used for the final scoring. Students who do not pass one of the colloquia (less than 50% of the test solved) will be given one remedial colloquium. During the course, the student must collect a minimum of 35 grade points in order to be able to take the final exam. A student who has obtained 35 or more points during the course can take the final exam, where he can obtain a maximum of 30 points. A student who collects a total of less than 35 grade points during classes is not satisfied, and is graded as failing (F) and must re-enroll in the course.

The final exam is written and oral, and includes material determined by the course plan and program. A maximum of 30 evaluation points can be collected on the final exam (10 points on the written and 20 points on the oral part of the exam). The final grade of the exam is formed according to the total activity of the student, i.e. from the grade points collected during the semester and the grade points on the final exam.

In order for a student to be evaluated with a final grade, he must successfully pass the final exam. For a positive evaluation of the final exam, the written and oral parts must be successfully completed. To the final exam, the student is obliged to bring a completed control sheet from the clinical exercises. If he does not pass the final exam, he will receive a negative grade. The student has the right to take the next exam period.

**Student evaluation:**

	Evaluation	Max. broj ocjenskih bodova
colloquium	1st	10

	2nd	10
	3rd	10
	<b>Ukupno</b>	<b>30</b>
<b>Practicals</b>	Continuous assesment of theoretical and practical knowledge. (Table 2)	<b>30</b>
<b>Seminars</b>	Written form (PP presentation) and oral presentation	<b>10</b>
	<b>Total</b>	<b>70</b>

Average grade on practicals (A-C)	Average grade on practicals (5-1)	Total average grade on practicals	Grade points
A	5	4,5- 5	30
A/B	4	3,5- 4,49	25
B	3	2,50- 3,49	20
B/C	2	2- 2,49	15
C	1	0- 1,99	0

Table 2. The practicals are evaluated and translated into evaluation points

Correct answers	Grade	Correct answers	Grade
0-10	0	18	8
11	1	19	9
12	2	20	10
13	3		
14	4		
15	5		
16	6		
17	7		

Table 3. Colloquia evaluation

Evaluation of the colloquium with 10 evaluation points

Colloquy 20 questions = 10 points

A student must have 50% correct answers to pass.

Evaluation of the final exam with 30 marks

10 points - written part of the exam

20 points - oral part of the exam

Formation of the final grade:

The grades obtained during the semester are joined by the points obtained on the final exam. Based on the total sum of points, students are evaluated as follows:

A (5) – 90-100 grade points

B (4) – 75-89.9 grade points

C (3) – 60-74.9 grade points

D (2) – 50-59.9 grade points

F (1) – 0-49.9 grade points

The numerical evaluation system is compared with the ECTS system as follows: A - excellent (5), B - very good (4), C - good (3), D - sufficient (2), F - insufficient (1).

#### Other important information regarding to the course:

##### Retaking the course:

In case of re-enrolling the course the students have the same responsibilities as the first time attendees and are obliged to regularly attend, actively participate and complete assignments in all forms of teaching.

#### COURSE SCHEDULE (for academic year 2022/23)

Date	Lectures (time)	Seminars	Practicals	Instructor
19.2.2024.	L1 (9.00-9.45)			Prof. Alen Braut, PhD, DMD
	L2 (9.30-10.30)			Prof. Alen Braut, PhD, DMD
	L3 (10.30-11.15)			Prof. Alen Braut, PhD, DMD
	Pause			
	L4 (11.30-12.15)			Prof. Alen Braut, PhD, DMD
	L5 (12.15-13.00)			Prof. Alen Braut, PhD, DMD
	L6 (13.00-13.45)			Prof. Alen Braut, PhD, DMD
	L7 (13.45-14.30)			Prof. Alen Braut, PhD, DMD
20.02.2024.	L8 (14.00- 14.45)			Prof. Alen Braut, PhD, DMD
	L9 (14.45-15.30)			Prof. Alen Braut, PhD, DMD
	L10 (15.30-16.15)			Prof. Alen Braut, PhD, DMD
	Pause			
	L11 (16.45- 17.30)			Prof. Alen Braut, PhD, DMD
	L12 (17.30-18.15)			Prof. Alen Braut, PhD, DMD
	L13 (18.15-19.00)			Prof. Alen Braut, PhD, DMD
	L14 (19.00-19.45)			Prof. Alen Braut, PhD, DMD
21.02. 2024.		S1 (14.00-14.45)		D.Šnjarić, PhD, DMD

			P1A (14.45-16.15)	E. Paljević, DMD
			P1B (14.45-16.15)	E. Božac DMD
		S2 (16.30-17.15)		D.Šnjarić, PhD, DMD
			P2A (17.15-18.45)	E. Paljević, DMD
			P2B (17.15-18.45)	E. Božac DMD
22.02. 2024.		S3(8.00-8.45)		Assist Prof R.Peršić Bukmir, PhD DMD
			P3A (8.45-10.15)	E. Paljević, DMD
			P3B (8.45-10.15)	E. Božac DMD
		S4 (10.30-11.15)		Assist Prof D.Šnjarić, PhD, DMD
			P4A (11.15-12.45)	E. Paljević, DMD
			P4B (11.15-12.45)	E. Božac DMD
		S5 (13.15-14.00)		Assist Prof R.Peršić Bukmir, PhD DMD
			P5A (14.00-15.30)	E. Paljević, DMD
			P5B (14.00-15.30)	E. Božac DMD
23.02.2024.		S6 (8.00-8.45)		Assist Prof D.Šnjarić, PhD, DMD
			P6A (8.45-10.15)	E. Paljević, DMD
			P6B (8.45-10.15)	E. Božac DMD
		S7 (10.30-11.15)		Assist Prof R.Peršić Bukmir, PhD DMD
			P7A (11.15-12.45)	E. Paljević, DMD
			P7B (11.15-12.45)	E. Božac DMD
		S8 (13.15-14.00)		Assist Prof R.Peršić Bukmir, PhD DMD
			P8A (14.00-15.30)	E. Paljević, DMD
			P8B (14.00-15.30)	E. Božac DMD
26.02.2024.		S9 (8.00-8.45)		Assist Prof D.Šnjarić, PhD, DMD
			P9A (8.45-10.15)	E. Paljević, DMD
			P9B (8.45-10.15)	E. Božac DMD
		S10 (10.30-11.15)		Assist Prof D.Šnjarić, PhD, DMD
			P10A (11.15-12.45)	E. Paljević, DMD
			P10B (11.15-12.45)	E. Božac DMD
27.02.2024.			P11A (8.45-10.15)	E. Paljević, DMD
			P11B (8.45-10.15)	E. Božac DMD



			P12A (10.15-11.45)	E. Paljević, DMD
			P12B (10.15-11.45)	E. Božac DMD
			P13A (12.30-14.00)	E. Paljević, DMD
			P13B (12.30-14.00)	E. Božac DMD
28.02.2024.			P14A (8.45-10.15)	E. Paljević, DMD
			P14B (8.45-10.15)	E. Božac DMD
			P15A (10.15-11.45)	E. Paljević, DMD
			P15B (10.15-11.45)	E. Božac DMD
01.03. 2024.	<b>Colloquium A + B (8.00-8.45)</b>			
Part II				
04.03.2024.			P1A (16.00-16.45)	E. Paljević, DMD
			P1B (17.00-17.45)	E. Božac DMD
11.03.2024.			P2A (16.00-16.45)	E. Paljević, DMD
			P2B (17.00-17.45)	E. Božac DMD
18.03. 2024.			P3A (16.00-16.45)	E. Paljević, DMD
			P3B (17.00-17.45)	E. Božac DMD
25.03. 2024.			P4A (16.00-16.45)	E. Paljević, DMD
			P4B (17.00-17.45)	E. Božac DMD
01.04. 2024.			P5A (16.00-16.45)	E. Paljević, DMD
			P5B (17.00-17.45)	E. Paljević, DMD
08.04. 2024.			P6A (16.00-16.45)	E. Paljević, DMD
			P6B (17.00-17.45)	E. Božac DMD
15.04. 2024.			P7A (16.00-16.45)	E. Paljević, DMD
			P7B (17.00-17.45)	E. Božac DMD
22.04. 2024.			P8A (16.00-16.45)	E. Paljević, DMD
			P8B (17.00-17.45)	E. Božac DMD
29.04.2024.			P9A (16.00-16.45)	E. Paljević, DMD
			P9B (17.00-17.45)	E. Božac DMD

06.05.2024.			P10A (16.00-16.45)	E. Paljević, DMD
			P10B (17.00-17.45)	E. Božac DMD

**List of lectures, seminars and practicals:**

	LECTURES (Topics)	Teaching hours	Location/Lecture room
L1	Introduction to Restorative Dental Medicine. Basic and modern principles of cavity preparation and filling treatment (I and II class)	1	Lecture room Krešimirova 42
L2	Basic and modern principles of cavity preparation and filling treatment (III, IV and V class)	1	Lecture room Krešimirova 42
L3	Principles of adhesive cavity design	1	Lecture room Krešimirova 42
L4	Applied histology of hard dental tissues	1	Lecture room Krešimirova 42
L5	Dentin wound and preparations for the protection of the pulpo-dentine complex. Temporary restorations	1	Lecture room Krešimirova 42
L6	Dental cements (zinc-phosphate, carboxylate, glass-ionomer)	1	Lecture room Krešimirova 42
L7	Glass-ionomer cements I	1	Lecture room Krešimirova 42
L8	Glass-ionomer cements II	1	Lecture room Krešimirova 42
L9	Dental amalgams	1	Lecture room Krešimirova 42
L10	Composite materials. Composition and application	1	Lecture room Krešimirova 42
L11	Composite materials. Polymerization lamps	1	Lecture room Krešimirova 42
L12	Dentin adhesives I	1	Lecture room Krešimirova 42
L13	Dentin adhesives II	1	Lecture room Krešimirova 42
L14	Acute vs chronic and iatrogenic dental trauma	1	Lecture room Krešimirova 42
	<b>TOTAL TEACHING HOURS</b>	<b>15</b>	

	SEMINARS (Topics)	Teaching hours	Location/Lecture room
S1	Workplace, instruments, dry working field (Eng. Rubber-dum)	1	Lecture room Krešimirova 42
S2	Basic principles of class I and II cavity preparations	1	Lecture room Krešimirova 42
S3	Basic principles of class III and V cavity preparation for amalgam and composite	1	Lecture room Krešimirova 42
S4	Basic principles of class IV and VI cavity preparation	1	Lecture room Krešimirova 42

S5	Dental cements (zinc phosphate, polycarboxylate)	1	Lecture room Krešimirova 42
S6	Glass-ionomer cements	1	Lecture room Krešimirova 42
S7	Dental amalgams; interdental matrices, clamps and interdental wedges	1	Lecture room Krešimirova 42
S8	Adhesive cavity and dentine adhesives	1	Lecture room Krešimirova 42
S9	Composite materials and finishing restorations	1	Lecture room Krešimirova 42
S10	Acute dental trauma	1	Lecture room Krešimirova 42
<b>TOTAL TEACHING HOURS</b>		<b>10</b>	

	<b>PRACTICALS (Topics)</b>	<b>Teaching hours</b>	<b>Location/Lecture room</b>
<b>PART I</b>			
P1	Dental history, patient's consent	2	Preclinical practicum, Krešimirova 42
P2	Establishment of a dry working field, rubber dam placement (Kofferdam in German)	2	Preclinical practicum, Krešimirova 42
P3	Preparation of Class I cavity for amalgam	2	Preclinical practicum, Krešimirova 42
P4	Preparation of class II cavity for amalgam	2	Preclinical practicum, Krešimirova 42
P5	Preparation of class V cavities for amalgam	2	Preclinical practicum, Krešimirova 42
P6	Preparation of II class adhesive cavity	2	Preclinical practicum, Krešimirova 42
P7	Preparation of III class adhesive cavity	2	Preclinical practicum, Krešimirova 42
P8	Placement of cavity liners and bases	2	Preclinical practicum, Krešimirova 42
P9	Placement of interdental matrix and matrix holder on models, interdental wedges	2	Preclinical practicum, Krešimirova 42
P10	Class I and V amalgam restorations	2	Preclinical practicum, Krešimirova 42
P11	Class II amalgam restorations	2	Preclinical practicum, Krešimirova 42

P12	Class II composite restorations	2	Preclinical practicum, Krešimirova 42
P13	Class III composite restorations	2	Preclinical practicum, Krešimirova 42
P14	Finishing and polishing of amalgam and composite restorations	2	Preclinical practicum, Krešimirova 42
P15	Repeating tasks according to free choice	2	Preclinical practicum, Krešimirova 42
PART II			
P1	First examination, dental status, treatment plan	1	Dental office no. 1, Krešimirova 40
P2	First examination, dental status, treatment plan	1	Dental office no. 1, Krešimirova 40
P3	First examination, dental status, treatment plan	1	Dental office no. 1, Krešimirova 40
P4	Minimally invasive procedures	1	Dental office no. 1, Krešimirova 40
P5	Minimally invasive procedures	1	Dental office no. 1, Krešimirova 40
P6	Minimally invasive procedures	1	Dental office no. 1, Krešimirova 40
P7	Treatment of medium and deep carious lesions	1	Dental office no. 1, Krešimirova 40
P8	Treatment of medium and deep carious lesions	1	Dental office no. 1, Krešimirova 40
P9	Treatment of medium and deep carious lesions	1	Dental office no. 1, Krešimirova 40
P10	Treatment of medium and deep carious lesions	1	Dental office no. 1, Krešimirova 40
P11	Treatment of medium and deep carious lesions	1	Dental office no. 1, Krešimirova 40
P12	Treatment of medium and deep carious lesions	1	Dental office no. 1, Krešimirova 40
P13	Treatment of medium and deep carious lesions	1	Dental office no. 1, Krešimirova 40
P14	Treatment of medium and deep carious lesions	1	Dental office no. 1, Krešimirova 40
P15	Treatment of medium and deep carious lesions	1	Dental office no. 1, Krešimirova 40
<b>TOTAL TEACHING HOURS</b>		<b>45</b>	