

Course: Dental Caries

Course Coordinator: Prof. Alen Braut, PhD, DMD

Department: Endodontics and restorative dentistry

Study program: Integrated Undergraduate and Graduate University Study of Dental Medicine

Study year: 2nd

Academic year: 2025 / 2026

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 train students to diagnose and set a treatment plan for initial dental carious lesions, as well as to acquire knowledge about the complex interaction of factors in the development of dental caries. The objectives of the course are to learn how to clinically recognize the initial and also the advanced carious lesions of the teeth and to improve the use of modern diagnostic procedures in the prevention of dental caries.

Assigned reading:

GJ Mount, WR Hume, HC Ngo, MS Wolff. Preservation and Restoration of Tooth Structure. 3rd Ed. Willey Blackwell. 2016.

Optional/additional reading:

Dental Caries: The Disease and its Clinical Management by Ole Fejerskov (Editor), Bente Nyvad (Editor), Edwina Kidd (Editor) (8-May-2015).

COURSE TEACHING PLAN:

The list of lectures (with topics and descriptions):

L1. Development of teeth and origin of formative tissues

Learning outcomes:

- describe and explain the aim of the Dental Caries course
- describe development of teeth and surrounding tissues

L2. Morphological and structural irregularities of hard dental tissues.

Learning outcomes:

- define physiological and pathological forms of tooth development
- explain the origin of certain structural and morphological irregularities of the teeth

L3. Theories about the occurrence of caries. Epidemiology of caries.

Learning outcomes:

- describe historical theories about the occurrence of caries
- explain the scientific basis of certain theories about the occurrence of caries
- describe and explain the ways of recording caries prevalence in the world
- name the modern theory of dental caries

L4. Etiology and definition of dental caries, clinical picture and clinical classification.

Learning outcomes:

- define the causes of dental caries
- explain the consequences of tooth decay and the clinical appearance of affected teeth
- define the clinical classification of caries

L5. Caries as a specific microbial infection

Learning outcomes:

- define the microbes that cause dental caries
- explain the mechanisms of action of microorganisms on dental tissues

L6. Pathohistological picture of caries and pathohistological classification

Learning outcomes:

- define the pathohistological layers of dental caries
- define the pathohistological classification of dental caries
- describe the composition of the carious lesion layers of enamel and dentin

L7. Diagnostics of dental caries.

Learning outcomes:

- define the possibilities of diagnostic procedures in caries detection
- explain the mechanisms of diagnosing carious lesions
- explain the cooperation of specialists in dental pathology with various specialties of dental medicine

L8. Dento-bacterial plaque: formation, composition and structure

Learning outcomes:

- describe the mechanisms of dental plaque formation
- name and describe the structure and composition of dental plaque

L9. Chemical events in enamel and dentin during the carious process.

Learning outcomes:

- explain the chemical processes during the formation of a carious lesion
- define the stages of carious lesion formation
- define the differences between enamel caries and dentin caries

L10. Assessment of the risk of caries.

Learning outcomes:

- define the degrees of risk of carious lesions
- define the factors of occurrence and their role in assessing the risk of new caries or the progression of an existing caries

L11. Prevention of dental caries (biochemical approach).

Learning outcomes:

- define the procedures of the non-operative approach to the prevention of dental caries
- describe and explain the mechanisms of action of preventive procedures

L12. Caries prevention (clinical approach)

Learning outcomes:

- define procedures for the operative approach to the prevention of dental caries
- describe and explain the advantages and disadvantages of operational preventive procedures

The list of seminars with descriptions:

S1. Histopathological image of caries

Learning outcomes:

- describe the caries layers of dentin and enamel

S2. The role of dentobacterial plaque in the development of caries and its control.

Learning outcomes:

- explain the role of dentobacterial plaque in the development of caries
- list the measures to control dentobacterial plaque

S3. Clinical diagnosis of caries

Learning outcomes:

- name the clinical procedures for the diagnosis of dental caries
- explain the working methods of clinical diagnostic procedures

S4. Meaning and application of epidemiological results

Learning outcomes:

- calculate epidemiological indices
- describe the occurrence of caries in the world

S5. Risk factors for caries.

Learning outcomes:

- define the factors for the occurrence of caries
- connect the interplay of factors in the development of dental caries

S6. Data collection methodology for epidemiological analysis

Learning outcomes:

- describe the methodology of data collection on dental caries
- explain the importance of precise data collection methodology

S7. Implementation of Epidemiological analysis and interpretation of results

Learning outcomes:

- explain the methods of implementing the analysis of the obtained data
- explain the significance of the obtained results of the epidemiological analysis

S8. Modern methods of controlling dental caries

Learning outcomes:

- define the methods of controlling dental caries and the influence on the factors of its occurrence
- explain the selection of a particular method of dental caries prevention

The list of practicals with descriptions:

The practicals will be performed at the Faculty of Dental Medicine and Clinic for Dental Medicine of the Rijeka Clinical Hospital Center. Before accessing individual exercises in small groups, students are required to acquire and demonstrate theoretical knowledge that they will perform practically initially with each other and later on patients. During the exercises, students will acquire the knowledge and skills necessary to detect initial and clinical caries lesions and establish a plan for preventive procedures therapy.

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 assessment is carried out in accordance with the current University of Rijeka Study Regulations.

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 50 grade points during the semester and a maximum of 50 grade points on the final exam).

During the semester, a student can collect a maximum of 50 grade points (table 1).

Of these, 20 on the colloquia, 10 in the seminar and practical work, and 20 for the nutritional diary report.

	Evaluation	Maximal grade points
Colloquium	Colloquium I	5
	Colloquium II	15
Practicals and seminars	Continuous oral assessment from practical/seminar supervisors	10
Nutritional diary	Assessment of nutritional habits report	20
	Total	50

Mandatory colloquia (up to 20 points)

During classes, all students are required to take 2 written colloquia from the given program, where they earn a maximum total of 20 points. Students have to receive a positive grade from both colloquia before applying for the final exam. In case of failing a colloquium (less than 50% correct answers) the student must retake it on a second term which will be held in agreement with the course coordinator on which a maximum grade of 50% can be received. The student can retake each colloquium only once. Grade points on colloquia are calculated by multiplying the percentage of correct answers (in decimal form) with the maximum amount of points that can be received on the colloquium.

Seminars + Practicals (up to 10 points)

Students are obliged to actively participate during the seminar. During class, seminar and practicals supervisors will evaluate how the students prepared for class based on oral examination

Nutritional diary

Before applying for the final exam student are obliged to turn in a nutrition diary and nutrition diary assessment which has to be graded with a positive grade.

IMPORTANT: If the student misses more than 30% of classes, either for excused or unjustified reasons, their right to continue participating in the course and attending the final exam is cancelled. With this, the student has collected OECTS points and receives the grade F.

Evaluation of the final exam with 50 marks

The final exam is a written test on which a total of 50 grade points can be obtained. To pass the final exam the student has to have at least 50% correct answers. Grade points are calculated by multiplying the percentage of correct answers (in decimal form) with the maximum number of points that can be received on the colloquium.

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 graded 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).

Passing the DENTAL CARIES exam is a REQUIREMENT for admission to the Course of RESTORATIVE DENTAL MEDICINE I.

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.

Every form of plagiarism, and use of AI tools such as ChatGPT for such causes is considered as violation of author rights. Such behavior will not be tolerated and will be sanctioned.

Consultations: Consultations with teachers need to be scheduled via e-mail.

COURSE SCHEDULE
2025/2026

Date	Lectures	Seminars	Practicals	Instructor
20.10.2025.	L1 (14.00-14.45)			Prof. Alen Braut, PhD,DMD
	L2 (14.45-15.30)			Prof. Alen Braut, PhD,DMD
	L3 (15.30-16.15)			Prof. Alen Braut, PhD,DMD
	L4 (16.15-17.00)			Prof. Alen Braut, PhD,DMD
27.10.2025.	L5 (14.00-14.45)			Prof. Alen Braut, PhD,DMD
	L6 (14.45-15.30)			Prof. Alen Braut, PhD,DMD
	L7 (15.30-16.15)			Prof. Alen Braut, PhD,DMD
	L8 (16.15-17.00)			Prof. Alen Braut, PhD,DMD
03. 11.2025.		S1 (14.00-14.45)		Prof. Alen Braut, PhD,DMD
		S2 (14.45-15.30)		Prof. Alen Braut, PhD,DMD
		S3 (15.30-16.15)		Prof. Alen Braut, PhD,DMD
	L9 (16.15-17.00)			Prof. Alen Braut, PhD,DMD
10.11.2025.	L10 (14.00-14.45)			Prof. Alen Braut, PhD,DMD
	L11 (14.45-15.30)			Prof. Alen Braut, PhD,DMD
	L12 (15.30-16.15)			Prof. Alen Braut, PhD,DMD
		S4 (16.15-17.00)		Prof. Alen Braut, PhD,DMD
17.11.2025.		S5 L10 (14.00-14.45)		Prof. Alen Braut, PhD,DMD
		S6 (14.45-15.30)		Prof. Alen Braut, PhD,DMD
		S7 (15.30-16.15)		Prof. Alen Braut, PhD,DMD
		S8 (16.15-17.00)		Prof. Alen Braut, PhD,DMD
24.11.2025.	Colloquium I (14.00-14.45)			Prof. Alen Braut, PhD,DMD
			P1A (14.45-15.30) P1B (14.45-15.30)	Prof. Alen Braut, PhD,DMD Elvis Božac, PhD, DMD
			P2A (15.30-16.15) P2B (15.30-16.15)	Prof. Alen Braut, PhD,DMD Elvis Božac, PhD, DMD
			P3A (16.15-17.00) P3B (16.15-17.00)	Prof. Alen Braut, PhD,DMD Elvis Božac, PhD, DMD

			P4A (17.00-17.45) P4B (17.00-17.45)	Prof. Alen Braut, PhD,DMD Elvis Božac, PhD, DMD
			P5A (17.45-18.30) P5B(17.45-18.30)	Prof. Alen Braut, PhD,DMD Elvis Božac, PhD, DMD
25.11.2025.			P6B (8.00-8.45) P6A (8.00-8.45)	Prof. Alen Braut, PhD,DMD Elvis Božac, PhD, DMD
			P7B (8.45-9.30) P7A (8.45-9.30)	Prof. Alen Braut, PhD,DMD Elvis Božac, PhD, DMD
			P8B (9.30-10.15) P8A (9.30-10.15)	Prof. Alen Braut, PhD,DMD Elvis Božac, PhD, DMD
			P9B (10.15-11.00) P9A (10.15-11.00)	Prof. Alen Braut, PhD,DMD Elvis Božac, PhD, DMD
			P10B(11.00-11.45) P10A(11.00-11.45)	Prof. Alen Braut, PhD,DMD Elvis Božac, PhD, DMD
	Colloquium II (12.00-12.45)			Prof. Alen Braut, PhD,DMD

List of lectures, seminars and practicals:

	LECTURES (Topics)	Teaching hours	Location/Lecture room
L1	Development of teeth and origin of formative tissues	1	Kresimirova 42
L2	Morphological and structural irregularities of hard dental tissues	1	Kresimirova 42
L3	Theories about the occurrence of caries. Epidemiology of caries.	1	Kresimirova 42
L4	Etiology and definition of dental caries, clinical picture and clinical classification.	1	Kresimirova 42
L5	Caries as a specific microbial infection	1	Kresimirova 42
L6	Pathohistological picture of caries and pathohistological classification	1	Kresimirova 42
L7	Diagnostics of dental caries	1	Kresimirova 42
L8	Dento-bacterial plaque: formation, composition and structure	1	Kresimirova 42
L9	Chemical events in enamel and dentin during the carious process.	1	Kresimirova 42
L10	Assessment of the risk of caries.	1	Kresimirova 42
L11	Prevention of dental caries. (biochemical approach).	1	Kresimirova 42
L12	Caries prevention. (clinical approach)	1	Kresimirova 42
	TOTAL TEACHING HOURS	12	

	SEMINARS (Topics)	Teaching hours	Location/Lecture room
S1	Histopathological image of caries	1	Kresimirova 42
S2	The role of dentobacterial plaque in the development of caries and its control.	1	Kresimirova 42
S3	Clinical diagnosis of caries	1	Kresimirova 42
S4	Meaning and application of epidemiological results	1	Kresimirova 42
S5	Risk factors for caries.	1	Kresimirova 42

S6	Data collection methodology for epidemiological analysis	1	Kresimirova 42
S7	Implementation of Epidemiological analysis and interpretation of results	1	Kresimirova 42
S8	Modern methods of controlling dental caries	1	Kresimirova 42
	TOTAL TEACHING HOURS	8	

	PRACTICALS (Topics)	Teaching hours	Location/Lecture room
P1	Sampling for inoculation and microbiological analysis of planktonic and dentobacterial plaque bacteria.	1	Kresimirova 40
P2	Analysis of the results of planktonic and dentobacterial plaque bacteria	1	Kresimirova 40
P3	Clinical diagnosis of caries in student groups	1	Kresimirova 40
P4	Clinical diagnosis of caries in student groups	1	Kresimirova 40
P5	Clinical diagnosis of caries in student groups	1	Kresimirova 40
P6	Clinical diagnosis of caries in student groups	1	Kresimirova 40
P7	Clinical diagnosis of caries in KBC Ri patients.	1	Kresimirova 40
P8	Clinical diagnosis of caries in KBC Ri patients	1	Kresimirova 40
P9	Survey on eating habits and advice on nutrition	1	Kresimirova 40
P10	Determining caries risk and creating a therapy plan by computer analysis of the collected data.	1	Kresimirova 40
	TOTAL TEACHING HOURS	10	

	FINAL EXAM DATES
1.	1.12.2025.
2.	15.12.2025.
3.	12.1.2026.