Sveučilište u Rijeci
University of Rijeka

Sveučilište u Rijeci • Fakultet dentalne medicine
University of Rijeka • Faculty of Dental Medicine

Krešimirova 40/42 • 51000 Rijeka • CROATIA
Phone : + 385 51 559 200; 559 202, 559 203

Course: Preclinical Orthodontics
Course Coordinators: Assistant Professor Magda Trinajstić Zrinski, PhD, Assistant Professor Višnja Katić, PhD
Course Collaborators: Professor Stjepan Spalj, MSc, PhD, Visiting professor Vaska Vandevska-Radunovic
Department: Department of Orthodontics
Study program: University Integrated Undergraduate and Graduate Study of Dental Medicine (in English)
Study year: 4th
Academic year: 2024/25

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 course **Preclinical Orthodontics** is a compulsory course in the first year of the Integrated Undergraduate and Graduate University Study of Dental Medicine and consists of 15 hours of lectures and 30 hours of practicals, totaling 45 hours (3 ECTS). The course is delivered in the premises of the Faculty of Dental Medicine and via e-course on the Merlin platform.

The aim of the course is to educate students on the growth and development of the craniofacies and the dentition, on preclinical orthodontic procedures and on the design and manufacture of removable and fixed orthodontic appliances.

The content of the course is as follows:
Growth and development of the craniofacies and the dentition. Methods of following growth and development. Key of occlusion. Taking impressions and manufacture of plaster casts. Design and laboratory fabrication of retention clasps, labial arch and springs. The design and positioning of screws. Polymerization techniques for the manufacturing of orthodontic appliances. The manufacturing of vacuum-formed appliances. Soldering and brazing. Construction of fixed appliances. Polishing of removable orthodontic appliances. Bite templates and the fixator. Philosophy and neurophysiology of the construction bite.

Teaching:
Teaching is held in the form of lectures and practicals. During the practicals, the lecturer supervises the students' independent work and encourages them to discuss the theme of the present practical. Students are required to attend the praticals wearing adequate working uniforms. They are also required to prepare for the practicals by reading the recommended literature. Additional forms of teaching include independent tasks, education using multimedia and the Internet as well as mentor work. A kolokvij will be held during the lessons. After the end of the lessons a practical kolokvij, as well as a final exam will be held. By completing all the assignments and the exam, the student obtains 3 ECTS points.
assesses the students' readiness to present the topic and moderates the discussion. There is a final examination at the end. By completing all teaching activities 3 ECTS points is acquired.

Assigned reading:

- Proffit, W.R. Contemporary Orthodontics. Philadelphia: Elsevier; 2019. (Section I and II, pp. 3-161)
- Littlewood SJ, Mitchell L. An introduction to orthodontics. 5th ed. London: Oxford University Press; 2019.

Optional/additional reading:

- Georgieva Gurgurieva, V. Orthdontic Syllabus for Students. Sofia: Medical University of Sofia; 2014.
- Bishara SE. Textbook of orthodontics. Philadelphia: WB Saunders Company; 2001. (Section I. Growth and development, pp. 1-98.
- Wirtz U. Atlas of orthodontic and orofacial orthopedic technique. Ispringen: Dentaurum; 2007.

COURSE TEACHING PLAN:

The list of lectures (with topics and descriptions):

L1 Introduction to orthodontics and classification of malocclusion
Define the scope of orthodontics. Define malocclusion.
L2 Keys of occlusion
Name Andrews' six keys of occlusion and explain their importance
L3 Etiology of malocclusion
Discuss the factors that lead to the development of malocclusion and the possibilities of prevention.
Analyze the role of general and local factors in the development of malocclusion.
L4 Concepts of growth and development
Explain the theories and mechanisms of growth and development of the craniofacial region.
L5 Prenatal growth and development of the head and face
Describe the growth of the craniofacial region in utero.
L6 Postnatal growth and development of the head and face
Describe the postnatal growth and development of the head and face
L7 Growth and development of the dentition 1 – edentulous alveolar ridge and the primary dentition
Define intermaxillary relationships during the phase of edentulous alveolar ridges
Describe the appearance and characteristics of the primary dentition. Recognize the risky primary dentition.
L8 Growth and development of the dentition 2 – mixed and permanentnt dentition
Describe the characteristics of the mixed dentition. Distinguish the early and late mixed dentition and recognize physiological processes in tooth positioning during the change of dentition.
Discuss the chronology of the change of dentition.
Define the characteristics of the permanent dentition.
L9 Orthodontic appliances
Analyse the types of orthodontic appliances.
L10 Plate appliances
Analyze the types of plate appliances. Recognize the stabilization, retentive and active parts of plate appliances.
L11 Functional appliances
Describe the types of functional appliances. Explain the philosophy of the activity of functional appliances.
L12 Segmented fixed appliances
Recognize the types of fixed orthodontic appliances.
L13 The continuous fixed appliance

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Analyze the parts of the continuous fixed appliance, distinguish the standard edgewise from the straight weire appliance, the labial and lingual technique, mode of bonding as well as treatment phases.

L14 Preventive appliances and procedures

Describe the preventive appliances and procedures. Recognize situations in which these may be necessary.

L15 Interceptive appliances and procedures

Describe the interceptive appliances and procedures. Recognize situations in which these may be necessary.

The list of seminars with descriptions:

The list of practicals with descriptions:

P1 Impression procedures and casts

Obtain the skill of taking orthodontic impressions. Define and describe plaster casts in orthodontics.

P2 Analysis of plaster casts – tooth position

Define and describe the types of tooth malposition. Understand the relationship between tooth malposition and malocclusion.

P3 Analysis of plaster casts in three dimensions

Recognize malocclusions on plaster casts in three dimensions.

P4 Basics of radiologic cephalometry

Describe the process of recording the lateral cephalogram

Know the principal sagittal, vertical and incisor-related cephalometric parameters.

P5 Cephalometric following of growth

Recognize the importance of superimposition of lateral cephalograms for following the the growth and for assessing orthodontic treatment results.

Know the superimposition according to Pancherz.

P6 Analysis of the orthopantomogram

Describe skeletal and dental structures and recognize anomalies of the number of teeth on the orthopantomogram.

P7 Differences between primary and permanent teeth on plaster casts

Distinguish primary and permanent teeth on plaster casts.

P8 Estimates of dental and skeletal age

Determine the dental age by analysing the orthopantomogram. Determine skeletal maturity by analysing cervical vertebrae.

P9 Plate appliances – techniques of manufacture and recognition

Describe the different parts of the plate appliance. Describe the techniques of manufacturing plate appliances.

P10 Functional appliances. Manufacturing the bite template and production of the construction bite.

Produce the bite template and the construction bite for manufacturing an orthodontic functional appliance. Describe various functional appliances and their elements.

P11 Appliances produced by soldering and brazing – demonstration, recognizing the appliances

Describe the laboratory procedure of manufacturing metal appliances (Hyrax, Quad helix, transpalatal arch, lingual arch). Recognize the different appliances.

P12 Vacuum-formed thermoplastic appliances - demonstration, recognizing the appliances

Describe the laboratory procedure of manufacturing metal appliances (aligner, Essix retainer, positioner). Recognize the different appliances.

P13 Bonding of brackets on a cast.

Describe the activity of the fixed continuous appliance.

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Determine the phases of direct bonding of the fixed continuous appliance.
P14 Preventive and interceptive appliances and selective interproximal reduction
Define and describe the preventive and interceptive orthodontic appliances. Describe the indications for selective interproximal reduction of primary teeth and its purpose.

Students' obligations:

Students are required to attend regularly and participate actively in all forms of education. The colloquium and final exam are mandatory. The student may be absent from 30% of the teaching exclusively for health reasons, which needs to be corroborated by a doctor's note. Attendance of the lectures is mandatory. The student may compensate for the absence by a previous arranement with the course coordinator. If the student is absent from more than 30% of the teaching, he or she cannot continue following the course and is not allowed to participate at the final exam. This equals to 0 ECTS credits and an F grade.

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

ECTS credit grading system:
Student assessment is carried out according to the current Regulations on Studies of the University of Rijeka. Student work will be evaluated and graded during classes and at the final exam. Out of a total of 100 grade points, a student can achieve 50 points during classes and another 50 points on the exam.
Student assessment is performed using ECTS (A-F) and number system (5-1). Grading in the ECTS system is performed by absolute distribution.

Students who gain from 0 to 24.9% of grades that could be obtained during classes through forms of continuous monitoring and evaluation of students are graded F (unsuccessful), cannot gain ECTS credits and must re-enroll the course.
The student gains grades by actively participating in classes and performing the set tasks and attending the colloquiums in the following manner:

During the classes, the the evaluation is carried out by (maximum up to 50 points):

a) a written colloquium (up to 25 points)
b) a practical colloquium (up to 25 points)

a) Written colloquium (up to 25 points)
During the classes all students are required to attend a written colloquium in which that may gain a maximum of 25 points. The grading is performed by multiplying the resolution ratio with a weight of 0.25, while the threshold for passing the colloquium is 50%.

b) Practical colloquium (up to 25 points)
During classes all students all students are required to attend a practical colloquium in which that may gain a maximum of 25 points. The coordinator will grade the acquired knowledge and skills of the student with points in the following manner:

grade	scalar points
2	12.5
2-3	15

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3	17
3-4	19
4	21
4-5	23
5	25

Final exam (total 50 points)

Who can take the final exam:
Students who have achieved 50% and more grade points during classes through forms of continuous monitoring and evaluation of students.

Who cannot take the final exam:
Students who achieved from 0 to 49,9% of grades during classes are graded F (unsuccessful), cannot gain ECTS credits and must re-enroll in the course.

A maximum of 50 points may be gained in the final exam (range from 25 to 50).

The grading of the final exam in points is as follows:

grade	scalar points
2	25
2-3	29
3	33
3-4	37
4	42
4-5	46
5	50

To pass the final exam and for the final grade (including the addition of previously achieved grade points during classes), the student must have a positive grade in the final exam and achieve a minimum of 50% of points.

Assessment in the ECTS system is performed by absolute distribution, i.e. on the basis of the final achievement:
A– 90-100% points
B – 75-89,9 %
C – 60-74,9 %
D -- 50-59,9%
F – 0-49,9%

Grades in the ECTS system are transformed into a numerical 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:

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Teaching content and all information related to the course as well as exam dates can be found on the e-course on the Merlin platform.
Consultations: Wednesdays at 14:00

COURSE SCHEDULE (for the academic year 2024/2025)

Date	Lectures (time and place)	Seminars (time and place)	Practicals (time and place)	Instructor
24.2.2025.			P1 D (12.30-14.00) Krešimirova 42	Assist Prof Magda Trinajstić Zrinski, PhD
28.2.2025.	L1 asynchronous webinar			Assist Prof Magda Trinajstić Zrinski, PhD
3.3.2025.			P2 D (12.30-14.00) Krešimirova 42	Assist Prof Magda Trinajstić Zrinski, PhD
7.3.2025.	L2 (12.30-13.15) Krešimirova 40			Assist Prof Magda Trinajstić Zrinski, PhD
10.3.2025.			P3 D (12.30-14.00) Krešimirova 42	Assist Prof Magda Trinajstić Zrinski, PhD
14.3.2025.	L3 asynchronous webinar			Prof Vaska Vandevska-Radunović, PhD
17.3.2025.			P4 D (12.30-14.00) Krešimirova 42	Assist Prof Višnja Katić, PhD
21.3.2025.	L4 (12.30-13.15) Krešimirova 40			Assist Prof Višnja Katić, PhD
24.3.2025.			P5 D (12.30-14.00) Krešimirova 42	Assist Prof Višnja Katić, PhD
28.3.2025.	L5 asynchronous webinar			Prof Stjepan Špalj, PhD
31.3.2025			P6 D (12.30-14.00) Krešimirova 42	Assist Prof Magda Trinajstić Zrinski, PhD
4.4.2025.	L6 (12.30-13.15) Krešimirova 40			Assist Prof Magda Trinajstić Zrinski, PhD
7.4.2025.			P7 D (12.30-14.00) Krešimirova 42	Assist Prof Magda Trinajstić Zrinski, PhD
11.4.2025.	L7 (12.30-13.15) Krešimirova 40			Assist Prof Višnja Katić, PhD
14.4.2025.			P8 D (12.30-14.00) Krešimirova 42	Assist Prof Magda Trinajstić Zrinski, PhD
18.4.2025.	L8 (12.30-13.15) Krešimirova 40			Assist Prof Magda Trinajstić Zrinski, PhD

25.4.2025.	L9 asynchronous webinar			Prof Vaska Vandevska-Radunović, PhD
28.4.2025.			P9 D (12.30-14.00) Krešimirova 42	Assist Prof Magda Trinajstić Zrinski, PhD
2.5.2025	L10 (12.30-13.15) Krešimirova 40			Prof Stjepan Špalj, PhD
5.5.2025.			P10 D (12.30-14.00) Krešimirova 42	Assist Prof Višnja Katić, PhD
9.5.2025.	L11 asynchronous webinar			Assist Prof Višnja Katić, PhD
12.5.2025.			P11 D (12.30-14.00) Krešimirova 42	Assist Prof Magda Trinajstić Zrinski, PhD
16.5.2025.	L12 (12.30-13.15) Krešimirova 40			Assist Prof Višnja Katić, PhD
19.5.2025.			P12 D (12.30-14.00) Krešimirova 42	Assist Prof Magda Trinajstić Zrinski, PhD
23.5.2025.	L13 asynchronous webinar			Assist Prof Višnja Katić, PhD
26.5.2025.			P13 D (12.30-14.00) Krešimirova 42	Assist Prof Višnja Katić, PhD
2.6.2025			P14 D (12.30-14.00) Krešimirova 42	Assist Prof Višnja Katić, PhD
6.6.2025.	L14 (12.30-13.15) Krešimirova 40			Assist Prof Višnja Katić, PhD

List of lectures, seminars and practicals:

	LECTURES (Topics)	Teaching hours	Location/Lecture room
L1	Introduction to orthodontics and classification of malocclusion	1	webinar
L2	Keys of occlusion	1	Krešimirova 40
L3	Etiology of malocclusion	1	webinar
L4	Concepts of growth and development	1	Krešimirova 40
L5	Prenatal growth and development of the head and face	1	webinar
L6	Postnatal growth and development of the head and face	1	Krešimirova 40
L7	Growth and development of the dentition 1 – edentulous alveolar ridge and the primary dentition	1	webinar
L8	Growth and development of the dentition 2 – mixed and permanentnt dentition	1	Krešimirova 40
L9	Orthodontic appliances	1	webinar
L10	Plate appliances	1	Krešimirova 40
L11	Functional appliances	1	webinar

L12	Segmented fixed appliances	1	Krešimirova 40
L13	The continuous fixed appliance	1	webinar
L14	Preventive appliances and procedures	1	Krešimirova 40
L15	Interceptive appliances and procedures	1	webinar
	TOTAL TEACHING HOURS	**15**	

	SEMINARS (Topics)	Teaching hours	Location/Lecture room
	TOTAL TEACHING HOURS		

	PRACTICALS (Topics)	Teaching hours	Location/Lecture room
P1	Impression procedures and casts	2	Krešimirova 40
P2	Analysis of plaster casts – tooth position	2	Krešimirova 40
P3	Analysis of plaster casts in three dimensions	2	Krešimirova 40
P4	Basics of radiologic cephalometry	2	Krešimirova 40
P5	Cephalometric following of growth	2	Krešimirova 40
P6	Analysis of the orthopantomogram	2	Krešimirova 40
P7	Differences between primary and permanent teeth on plaster casts	2	Krešimirova 40
P8	Estimates of dental and skeletal age	2	Krešimirova 40
P9	Plate appliances – techniques of manufacture and recognition	2	Krešimirova 40
P10	Functional appliances. Manufacturing the bite template and production of the construction bite.	2	Krešimirova 40
P11	Appliances produced by soldering and brazing – demonstration, recognizing the appliances	2	Krešimirova 40
P12	Vacuum-formed thermoplastic appliances - demonstration, recognizing the appliances	2	Krešimirova 40
P13	Bonding of brackets on a cast.	2	Krešimirova 40
P14	Preventive and interceptive appliances and selective interproximal reduction	2	Krešimirova 40
	TOTAL TEACHING HOURS	**28**	

	FINAL EXAM DATES
1.	13.6.2025.
2.	27.6.2025.
3.	11.7.2025.

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4.	12.9.2025.

	Lectures	**Seminars**	**Practicals**	**Total**
Total number	15	0	30	43
On-line	8	0	0	8
Percentage	53%		0%	19%