1. BASIC INFORMATION

Course	Orthodontics II
Degree program	Dentistry
School	Biomedical and Health Sciences
Year	Third
ECTS	6 ECTS
Credit type	Compulsory
Language(s)	English/spanish
Delivery mode	On-site classroom course
Semester	Second semester
Academic year	2024-2025
Coordinating professor	Gloria Albero Romano

2. PRESENTATION

Orthodontics II takes place during the second semester of third grade of Bachelor's degree, with 6 ECTS. This compulsory subject provides basic and specific educational background about Biomechanics applied to orthodontics: The study of forces delivered by orthodontic appliances, teeth mechanical response to force and biology of tooth movement.
It also provides essential background on fixed and removable appliances: students will get basic theoretical and practical background to understand different clinical applications of orthodontic appliances.
The subject's timeline combines classroom activities with laboratory practical to allow inclusive knowledge and skills acquisition. It follows a chronological order that enables to gain progressive academic knowledge and ability to fabricate different orthodontic appliances.
Orthodontics II syllabus planification defines clearly core and specific competencies to develop the different learning levels of the subject. Lessons are given in English and Spanish due to the strong international nature of Universidad Europea de Madrid, providing the student enough tools to achieve a level of understanding to be able to develop professional international workload.
ECTS credits comprise class hours with the professor in classroom (master classes, tutorials, resolution of practical exercises) and work hours in a laboratory conducting preclinical practical, seminars and skill tests in a traditional simulation environment.
All this will enable the future graduate to acquire all indispensable knowledge to achieve correct diagnosis and orthodontic treatment planning, as well as to undertake subsequent subjects: Orthodontics III & IV.

3. COMPETENCIES AND LEARNING OUTCOMES

Core competencies:

- CB1. Students must prove they have knowledge on a specific field, based on the secondary general education. This knowledge is at a level that, apart from being supported by advanced textbooks, includes aspects that imply knowledge coming from the forefront of its field of study.

- CB2. Students are able to apply their knowledge to their professional work or vocation and prove to have these competences by proposing and defending arguments and by having the ability to solve problems on their study area.
- CB4. Students are able to transmit information, ideas, problems and solutions to a specialised and non-specialised public.
- CB5. Students have developed the learning skills needed to carry out works with a high level of personal autonomy.

Cross-curricular competencies:

- CT1. Autonomous learning: Process that enables a person to be in charge of its own development, choosing his path, strategies, tools and the best moment to learn and apply what has been learnt. An autonomous student, at the end, chooses the best strategies to fulfil his learning goals.
- CT4. Analysis and synthesis ability: Analysis is the reasoning methods that allow us to split up complicated situations into their components; also assesses other alternatives and perspectives to find out optimal solutions. Synthesis aims to reduce the complexity in order to have a better understanding and problem-solving capacity.
- CT7. Ethical value awareness: Ability to think and act according to the universal principles based on the personal values aimed at his full development related to the commitment of determined social values.
- CT8. Information management: Ability to search, choose, analyse and integrate information from different sources.
- CT9. Personal relationship values: Positive relationship with others verbally and non-verbally by assertive communication, understanding by this, the ability to express or transmit what is wanted, thought or felt without causing discomfort, attacking or hurting someone's feelings.

General competencies:

- GC1 Know the essential elements of the dentist profession, including ethical principles and legal responsibilities.
- GC3 Know how to identify the patient's concerns and expectations, as well as communicate effectively and clearly, both orally and in writing, with patients, family members, the media, and other professionals
- GC9 Understand the importance of maintaining and using records with patient information for subsequent analysis, preserving the confidentiality of the data
- GC12 Understand and recognize the normal structure and function of the stomatognathic apparatus, at the molecular, cellular, tissue and organic levels, at different stages of life.
- GC13 Understand and recognize the biomaterial sciences essential for dental practice as well as the immediate management of possible allergies to them
- GC14 Know about the general processes of the disease, among which are infection, inflammation, alterations of the immune system, degeneration, neoplasia, metabolic alterations, and genetic disorders.
- GC15 Be familiar with the general pathological characteristics of diseases and disorders that affect the organic systems, specifically those that have oral repercussions
- GC16 Understand the fundamentals of action, indications, and efficacy of drugs and other therapeutic interventions, knowing their contraindications, interactions, systemic effects, and interactions on other organs, based on the available scientific evidence
- GC17 Understand and recognize the principles of ergonomics and safety at work (including control of cross infection, radiation protection and occupational and biological diseases).
- GC20 Obtain and prepare a medical record that contains all the relevant information.
- GC21 Knowing how to perform a complete oral examination, including appropriate radiographic and complementary examination tests, as well as obtaining adequate clinical references.
- GC22 Have the ability to prepare an initial diagnostic judgment and establish a reasoned diagnostic strategy, being competent in recognizing situations that require urgent dental care.

- GC23 Establish the diagnosis, prognosis, and adequate therapeutic planning in all the clinical areas of Dentistry, being competent in the diagnosis, prognosis and preparation of the dental treatment plan for the patient that requires special care, including medically compromised patients (such as diabetics, hypertensive patients, immunosuppressed, anticoagulated, among others) and patients with disabilities. BOE no. 174 Saturday July 19, 2008, 31689.
- GC27 Raise and propose preventive measures appropriate to each clinical situation.
- GC30 Recognize the role of the dentist in the actions of prevention and protection against oral diseases, as well as in the maintenance and promotion of health, both individually and at the community level.

Specific competencies:

- SC9. Know the clinical and laboratory diagnostic procedures and tests, know their reliability and diagnostic validity, and be competent in the interpretation of their results.
- SC10. Recognise oral normality and pathology, as well as the evaluation of semiological data.
- SC13. Handle, discriminate and select appropriate materials and instruments in Dentistry.
- SC14. Know dental biomaterials: their handling, properties, indications, allergies, biocompatibility, toxicity, waste disposal and environmental impact.
- SC16.Know and use basic equipment and instruments for dental practice
- SC18. Provide a comprehensive approach to oral care and apply the principles of health promotion and prevention of oral diseases.
- SC19. Educate and motivate patients in the prevention of oral diseases, control pathogenic oral habits, instruct them on proper oral hygiene, dietary and nutritional measures and, in summary, on all methods of maintaining oral health.

Learning outcomes:

- LO4.To Develop general specific competences for the clinical practice in orthodontics
- LO5.To Describe the basic concepts of Fixed and removable appliances in Orthodontics

The following table shows the relationship between the competencies developed during the course and the learning outcomes pursued:

Competencies	Learning outcomes
CB1, CB2, CB4, CB5, CT1, CT4, CT7, CT8, CT9, GC1, GC3, GC12, GC13, GC14, GC15, GC16, GC17, GC19, GC20, GC21, GC22, GC23, GC25, GC26, GC27, GC30, SC9, SC10, SC13, SC14	LO4
CB1, CB2, CB4, CB5, CT1, CT4, CT7, CT8, CT9, GC1, GC3, GC12, GC13, GC14, GC15, GC16, GC17, GC19, GC20, GC21, GC22, GC23, GC25, GC26, GC27, GC30, SC9, SC10, SC13, SC16, SC18, SC19	LO5

4. CONTENT

THEORETICAL CONTENT OF THE SUBJECT:

Unit 1: Biomechanics:

1.1. Concept of wire. Use of orthodontic wires. Physical properties of orthodontic wires. Hooke´s law. Wire classification: diameter, section, composition: Stainless steel, NiTi alloys

1.2. Biology of tooth movement: Tooth mechanical response to forces. Force concept, force systems, gresion-version tooth movements. Moment of force. Anchorage concept. Biology of tooth movement. Theories of tooth movement: Bio-electric and pressure-tension theories. Direct vs Indirect resorption.

1.3. Tissue reaction to forces: Effects of forces on osseous, pulp, root, enamel, periodontal ligament, alveolar bone and gingival tissues. Root resorption in orthodontics, clinical management of root resorption. Ways of applying orthodontic forces: decline index, duration, intensity, type of tooth movement

Unit 2: Introduction to removable and fixed Orthodontics

2.1. Removable appliances I: Classification of removable appliances: components, retention, stabilization, active and auxiliary elements. Indications and contraindications.

2.2. Removable appliances II: Active removable appliance design. Expansion and limited dental movements. Macro-screws and Digital springs. Clinical activation

2.3. Functional appliances: Mode of action. Craniofacial growth mechanisms. Effects of functional appliances in mandibular growth. Indications, Limitations. Constructive wax bite.

2.4. Adhesion in orthodontics: Orthodontic bands, Glass Ionomer cements, Composite resin cements.

2.5. Introduction to fixed orthodontics. History and evolution. Edge wise appliance. Straight arch appliance. Brackets: description, types, auxiliary elements. Direct bracket cementation. Fixed orthodontic treatment stages.

2.6. Two band fixed appliances I: Classification: Transpalatine arch: actions, indications and clinical use. Lingual arch Actions, indications and clinical use

2.7. Two band fixed appliances II: Nance appliance, Quadhelix, Head gear and lip-bumper.

In the virtual campus you will find a summary of the content given in the lectures. These summaries must be completed with the recommended bibliography

PRACTICAL CONTENTS:

1. Adams clasps
2. Ball end clasps, “C” clasps
3. Labial bow
4. Digital springs
5. Removable appliance I. Fabrication of active removable appliance
6. Removable appliance II. Trimming
7. Removable appliance III: Polishing
8. Band adaptation: band adaptation and fabrication of three working models with adapted bands
9. Transpalatine arch
10. Lingual arch
11. Quad-helix

5. TEACHING-LEARNING METHODOLOGIES

The types of teaching-learning methodologies used are indicated below:

- Master class
- Practical
- Tutorials
- Seminar
- Autonomous learning
- Knowledge and skills evaluation

6. LEARNING ACTIVITIES

Listed below are the types of learning activities and the number of hours the student will spend on each one:

Campus-based mode:

Learning activity	Number of hours
Master class	13
Collaborative learning	2
Practical	28
Tutorial	12
Seminar	8
Autonomous learning	74
Knowledge evaluation	8
Asynchronous master class	5
TOTAL	**150**

7. ASSESSMENT

Listed below are the assessment systems used and the weight each one carries towards the final course grade:

Campus-based mode:

Assessment system	Weight
Theoretical knowledge	38%
Practical evaluation	27%
Seminars	30%
Competencies	5%

When you access the course on the *Campus Virtual*, you'll find a description of the assessment activities you have to complete, as well as the delivery deadline and assessment procedure for each one.

7.1. First exam period

Orthodontics II consist of 3 parts (theoretical evaluation, laboratory practicals and seminars) that have to be passed independently with at least a 5 (out of 10).

1. Theoretical evaluation (40% of the final grade)

Your learning activities of knowledge and procedures, as well as autonomous study will be evaluated by a multiple choice question exam or by Short Written Questions at the end of Orthodontics I module.

A 5% of this grade can be obtained through a positive evaluation of cross-sectional competencies and 80% of class attendance.

Assistance to lectures is compulsory. Students failing to attend to 50% of all lectures will not be able to pass the subject during the first exam period.

2. Seminars evaluation (30 % of the final result)

A portfolio will be conformed with individual activities and group works. In order to pass this part of the subject, you need a mean value of 5. Each seminar must be graded with a value of "3" or more in order to calculate de final value.

If you fail to attend a class seminar, this will be evaluated as "0", even if the absence is properly justified.

You will be able to sit a final seminar exam if your average grade is below 5 and you have a maximum of ONE absence to seminars.

If you have 2 or more absences to seminars you will "fail" this part of the subject and you are only going to be able to recuperate it during the follow up period of the second exam period

3. Practical evaluation (30% of the final result)

Practical will be assessed in relation with the specific accomplishment you obtain in each one of the practical, by means of objective tests at the end of each block and the acquisition of manual skill competencies described in each one of the assessment procedures. A 10% of this grade corresponds to cross-sectional competencies.

In order to pass the practical, you need to get at least a 5. The final grade is an average of the different grades with a 3 or more in each of the practical evaluations. If you do not attend a practical evaluation, this will be graded as "0".

Continuous assessment

Students taking campus-based studies are required to demonstrate that they have attended at least 50% of their classes. Such attendance forms an essential part of the assessment process and is necessary to give the student the right to receive guidance, assistance and academic supervision from the professor. For such purposes, students must use the technological system put in place by the University to accredit their daily attendance at each of their classes. This system shall furthermore ensure that objective information is gathered regarding the active role of the student in the classroom. The failure to use the methods proposed by the University to demonstrate 50% attendance will give the professor the right to grade the course as a fail under the ordinary exam period. The foregoing does not affect other requirements of higher attendance percentages that each school may establish in their teaching guides or internal regulations.

Therefore, it is the authority of the professor that students who have not fulfilled the 50% of attendance in the ordinary call must pass all the evaluation tests in the extraordinary call, for which they must obtain a grade greater than or equal to 5.0 out of 10.0 in all of them (Faculty Board 11-07-23).

PLAGIARISM REGULATION

In accordance with article 6, point 12 of the REGULATION FOR THE EVALUATION OF OFFICIAL DEGREES OF THE EUROPEAN UNIVERSITY OF MADRID: Any student who disposes of or uses illegal means in carrying out an evaluation test, or who improperly attributes the authorship of academic work required for the evaluation, will have the grade of "fail" (0) in all the evaluation tests of the call in which the event occurred and may probably be subject to a sanction, prior to the opening of a disciplinary file.

7.2. Second exam period

To pass the course in the second exam period you are going to be evaluated of the part failed during the first exam period.

• To pass the theoretical part, you will have to pass the theory multiple choice question or short answer exam
• To pass the practical part, it will be compulsory to attend the follow up period and perform the failed practicals

• To pass the seminar part, you will have to pass the seminar final test, which includes all seminars from the course

8. SCHEDULE

This table shows the delivery deadline for each assessable activity in the course:

Assessable activities	Deadline
Activity 1: Seminar Removable appliance design	19-20-21 February
Activity 2: Wire bending	27-28th Feb
Activity 3: Active Removable appliance	2-3 April
Activity 4: Transpalatal Arch	9-10 April
Activity 5: Quad-helix	23-24 April
Activity 6: Practical evaluation	7-8 May
Activity 7: Seminar comprehensive diagnosis	20-21-22 May
Activity 8: Final objective evaluation	29th May

This schedule may be subject to changes for logistical reasons relating to the activities. The student will be notified of any change as and when appropriate.

9. BIBLIOGRAPHY

The main reference work for this subject is:

- J. A. Canut Brusola, "Ortodoncia Clínica y Terapéutica", 2ªEdición. Barcelona. Massón. 2000.

The recommended Bibliography is:

- J. Fernández y cols., "Manual de Prácticas de Odontopediatría, Ortodoncia y Odontología Preventiva", 1ª ed. Madrid, Editorial Ripano, 2006. ISBN: 84-609-7414-6.
- Fernández Sánchez J. & Da Silva Filho O. Atlas de cefalometría y análisis facial. 2009, 290 p. ISBN-13 978-84-936756-7-7 Editorial Ripano Madrid.
- W. R. Proffit, "Ortodoncia Contemporánea: Teoría y Práctica". 5ª Edición. Barcelona. Elsevier. 2014.
- J. Gregoret, "Ortodoncia y Cirugía Ortognática. Diagnóstico y Planificación". 2ª Edición. Amolca 2014
- J.A. McNamara, "Tratamiento Ortodóncico y Ortopédico en la Dentición Mixta". Editorial: Needham.Press 2018

10. EDUCATIONAL GUIDANCE AND DIVERSITY UNIT

From the Educational Guidance and Diversity Unit we offer support to our students throughout their university life to help them reach their academic achievements. Other main actions are the students inclusions with specific educational needs, universal accessibility on the different campuses of the university and equal opportunities.

From this unit we offer to our students:

1. Accompaniment and follow-up by means of counselling and personalized plans for students who need to improve their academic performance.
2. In terms of attention to diversity, non-significant curricular adjustments are made in terms of methodology and assessment for those students with specific educational needs, pursuing an equal opportunities for all students.
3. We offer students different extracurricular resources to develop different competences that will encourage their personal and professional development.
4. Vocational guidance through the provision of tools and counselling to students with vocational doubts or who believe they have made a mistake in their choice of degree.

Students in need of educational support can write to us at:
orientacioneducativa@universidadeuropea.es

11. ONLINE SURVEYS

Your opinion matters!

The Universidad Europea encourages you to participate in several surveys which help identify the strengths and areas we need to improve regarding professors, degree programs and the teaching-learning process.

The surveys will be made available in the "surveys" section in virtual campus or via e-mail.

Your assessment is necessary for us to improve.

Thank you very much for your participation.