1. BASIC INFORMATION

Course	Biomaterials and Instrumentation
Degree program	Dentistry
School	Biomedical Sciences
Year	2º Course
ECTS	6 Credits ECTS
Credit type	Basic
Language(s)	Spanish/English
Delivery mode	Presential
Semester	First Semester
Academic year	2025-2026
Coordinating professor	Eva González Tocado y Blanca Cèline de las Heras Vercher

2. PRESENTATION

This course aims that the student can achieve sufficient knowledge and skills related to: the evolution and classification of the different types of dental biomaterials. The main physical, chemical and biological general properties that must be taken into account when understanding, selecting and applying dental materials in their preclinical, clinical or laboratory aspects. Recognize and apply the hygienic and safety measures for the handling of each one of the materials used.

3. LEARNING OUTCOMES

Knowledge

KN01 Know the essential elements of the dental profession, includin gethical principles and legal responsibilities.

KN05 Promote autonomous learning of new knowledge and techniques, as well as motivation for quality.

KN10 Understand and recognise the sciences of biomaterials essential to dental practice, as well as the immediate management of potential allergies to them.

KN14 Understand and recognise the principles of ergonomics and safety at work (including cross-infection control, radiological protection and occupational and biological diseases).

KN23 To understand the scientific principles of sterilisation, disinfection and antisepsis necessary to prevent cross-infection in dental practice.

KN27 To understand dental biomaterials: their handling, properties, indications, allergies, bio-compatibility, toxicity, waste disposal and environmental impact. Subject-specific knowledge

- To know the evolution and classification of the different types of dental materials and biomaterials.
- To know the main general physical, chemical and biological properties that must be taken into account when understanding, selecting and applying dental materials in their preclinical, clinical or laboratory aspects.
- Recognise and apply ergonomic, hygienic and safety measures for the handling of each of the materials explained in the course.

Skills

SK16 Acquire pre-clinical experience under appropriate supervision in simulated environments.

Subject-specific skills

- Select and manipulate the appropriate materials and instruments in the simulated pre-clinical practice according to each intervention.
- Actively work with rotating instruments in simulated environments.
- Develop indirect vision in simulated environments.

Competences

CP04 Handle, discriminate and select appropriate materials and instruments in dentistry.

CP05 Apply the principles of ergonomics in dental work, both at the individual level and within the work team when appropriate, as well as in the principles of occupational risk prevention associated with dental practice.

CP44 Integrate analysis with critical thinking in a process of evaluating different ideas or professional possibilities and their potential for error, based on objective evidence and data leading to effective and valid decisionmaking.

4. CONTENT

- Materials in dentistry
- General Physical characteristics and properties of dental materials
- Characteristics and Chemical Properties of Dental Materials
- General Biological characteristics and properties of dental materials
- Polymeric materials
- Oral scanner and its versatility
- Ceramic materials
- Metallic materials
- Bone regeneration materials

5. TEACHING-LEARNING METHODOLOGIES

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

- MD1 Clase magistral
- MD3 Aprendizaje cooperativo
- MD8 Entornos de simulación

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	Presence %	Presential hours
AF1 Master classes	24,5	100	24,5
AF2 Practical application seminars	3	100	3
AF5 Oral presentations	5	100	5
AF8 Activities in practical course and/or laboratories	25	100	25
AF10 Self working	90	0	0
AF12 Presential Knolwledge test	2,5	100	2,5
TOTAL	150		60

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
SE1 Knowledge Test*	30%
SE2 Oral Activities	10%
SE6 Performance evaluation*	40%
SE7 Systematic observation*	10%
Practice notebook	10%
Total	100%

* SE1 Knowledge Test: Theoric exam
* SE6 Performance evaluation: preclinical practices, Spanish class and Simodont
* SE7 Systematic observation:therical written activities

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

In order to pass the course in the ordinary exam session, you must obtain a grade higher or equal to 5.0 out of 10.0 in the final grade (weighted average) of the course. However, this grade will only be valid if the minimum requirements established for each of the assessable blocks have been met, as indicated in the learning guide. This means that, even if the weighted average is equal to or higher than 5.0, the subject will not be passed if any of the parts have not reached the minimum grade required.

In any case, it will be necessary to obtain a grade higher or equal to 5.0 in the final exam, so that it can be averaged with the rest of the evaluable activities that have been passed according to the criteria established in the learning guide.

Furthermore, in order to take the final exam, you must have attended at least 50% of the scheduled classes and activities, as established in the course guide. This requirement applies regardless of whether the absences are justified or not. If the percentage of absences exceeds this limit, they cannot be justified in any case and this will imply the impossibility of passing the subject in that call.

To pass the subject in the ordinary call, both the theoretical knowledge tests, the practical knowledge tests and the Spanish classes must have been passed, with a grade greater than or equal to 5 (out of 10), separated. The final average will not be done if the three parts are not pass.

Mandatory requirements:

- The final theory exam will be done through a multiple-choice test at the end of the semester and may include questions aimed at the visual identification of images.
- This exam will consist of 40 multiple-choice questions (4 answers with only one correct answer). Correct answers will add 1-point, wrong answers will deduct 0.33 points and blank answers will score 0. There will be 4 reserve questions with the same evaluation conditions as the official ones.
- It is mandatory to answer 80% of the exam questions in order to pass the subject.
- The date of the final exam will be scheduled from the beginning of the course.
- Oral activities are not recoverable, since they do not prevent the continuous evaluation of the theoretical part carried out by the student and they only suppose additional marks to the final grade of the subject.
- The written activities will be carried out only in a pre-sectoral way, requiring a minimum of 9 of the 13 exercises that will be carried out throughout the course (the student will be able to recover only 2 activities on the day of the resumption of practices in the ordinary call). If this criterion is not met, they will recover during the follow-up period.

7.1.2. Practices

The evaluation of the practices will be carried out periodically after each thematic block by means of rubrics.
To pass the section of the practices of the subject, it is necessary to obtain a 5 (out of 10).

Mandatory requirements:

- Attendance at practices is mandatory and those students who accumulate 3 or more ABSENCES (even if they are justified) will lose the score of their Practical Continuous Evaluation.

- Simodont practice will be recoverable with a written activity.

- The global note of practices must be equal or higher than 5 (approved). If one of the grades of the practices is 3 or less, it is mandatory to assist on the recovery practices date, regardless of the final average.

- If the student does not pass the practices, she/he will not be able to pass the subject. If the Theory is failed and not the Practices, or the opposite, only the approved part will be kept until the extraordinary call in July, and only the failed part must be examined. The note will not be saved from one course to another.

- Two evaluable practices/activities not carried out, whether justified or not, may be recovered in the recovery session established within the ordinary call. Three or more evaluable practices/activities not carried out, whether justified or not, may be recovered in the recovery session established in the extraordinary call (under teachers' assessment).

- However, if the reason for recovery is an overlap in day and time with an exam of another subject of the Degree in Dentistry, the recovery of the evaluable practice/activity will be carried out based on the availability of the subject.

- The practice notebook must be handed in on the indicated dates ONLY in PDF format (the rest will not be assessed). It will be recoverable during the follow-up period.

7.2. Second exam period

In order to pass the course in the extraordinary call, you must obtain a grade higher or equal to 5.0 out of 10.0 in the final grade (weighted average) of the course.

In any case, it will be necessary to obtain a grade higher or equal to 5.0 in the final exam, so that it can be averaged with the rest of the evaluable activities.

Depending on the parts not passed in the ordinary exam, you will have to make up those that have not reached the minimum grade required:

- If you have not passed the theory exam, you will have to repeat this test in the extraordinary call.
- If you have not passed the practical part of the subject (practical exam), you will have to take it again, according to the indications of the course professors.
- If any of the continuous assessment activities (theoretical or practical) have not been passed or were not presented in the ordinary exam, you must complete them in person during the follow-

up period, at the established times. These activities may coincide with the original ones or be replaced by others, at the discretion of the professors.

The student must deliver the activities not successfully completed in the first exam period after having received the corresponding corrections from the professor, or those that were not delivered in the first place.

Simodont practice will be recoverable with a written activity.

8. SCHEDULE

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

Assessable activities	Deadline
1º TOPIC-TEACHER	9 September
2º TOPIC-TEACHER	16 September
3º TOPIC (part I)-TEACHER	23 September
3º TOPIC- (part II) TEACHER	30 september
4º TOPIC (part I) TEACHER	7 October
4º TOPIC-(part II)TEACHER	14 October
5º y 6º TOPIC TEACHER	21 October
7º Y 8º TOPIC TEACHER	28 October
9º Y 10º TOPIC STUDENTS:OP	4 November
11º Y 12º TOPIC STUDENTS:OP	11 November
13º Y 14º TOPIC STUDENTS: OP	18 November
15º Y 16º TOPIC STUDENTS:OP	25 November
17º Y 18º TOPIC STUDENTS:OP	2 December
19º Y 20º TOPIC STUDENTS:OP	9 December
TUTORIALS/DOUBTS	16 December
FINAL EXAM	January not yet determined

OP: Oral presentations

STUDENTS ORAL PRESENTATION

Topic 9. Polymeric Materials I-Printing Materials

Topic 10. Polymeric Materials II- Acrylics

Topic 11. Polymeric Materials III - Composite Resins

Topic 12. Polymeric materials IV. Waxes, thermoplastic materials, gutta-percha.

Topic 13. Ceramic Materials I. Plaster. Others

Topic 14. Ceramic Materials II. Cements

Topic 15. Ceramic Materials III. Porcelanas and viroceramicas

Topic 16. Metallic Materials I. Noble Metals.

Topic 17. Metallic Materials II. Non-noble metals.

Topic 18.- Metallic Materials III. Titanium and silver amalgams.

Topic 19. Metallic Materials IV. Other Metal Alloys

Topic 20. Bone Regeneration Materials

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

9. BIBLIOGRAPHY

The recommended Bibliography is:

- VEGA DEL BARRIO JM. Materials in dentistry. Biological, clinical and physicochemical fundamentals. Ed Advances. Madrid, 1996.

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- O'BRIEN WJ., RYGE G. Dental materials and their selection. Ed Medica Panamericana. Buenos Aires, 1980

- PEYTON FA., CRAIG RG. Restorative dental materials. Ed Mindi SAIC. Buenos Aires, 1974.

- BURDAIRON G. Manual of dental biomaterials. Ed Masson SA. Barcelona, 1991.

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- SMITH BG., WRIGH PS. Clinical use of dental materials. Ed Masson SA. Barcelona, 1996.

- ANUSAVICE by PHILLIPS Science of dental materials. 11 ed. Ed Mc Graw Hill Interamericana, Barcelona, 2004.

- MACHI L. Dental materials. Ed Panamericana, Buenos Aires, 2007.

10. EDUCATIONAL GUIDANCE, DIVERSITY AND INCLUSION UNIT

From the Educational Guidance, Diversity and Inclusion 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 mean 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 opportunity 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 on virtual campus or via e-mail.

Your assessment is necessary for us to improve.

Thank you very much for your participation.