

1. BASIC DATA

Subject	General Microbiology and Immunology
Qualification	Degree in Dentistry
School/Faculty	Faculty of Health Sciences
Course	First
ECTS	6 ECTS
Character	Basic
Language(s)	Spanish/English
Modality	Presential
Semester	Second Semester
Academic year	2024/2025
Coordinating teacher	Nicla Flacco

2. PRESENTATION

The aim of this course is for the dental student to learn the basic principles of medical microbiology and general immunology.

The knowledge and management of infections of the oral cavity is an important tool for the dentist, since it allows him/her to know their etiology, select the appropriate antimicrobial and also determine the efficacy of the prescribed treatment. In addition, it involves a series of actions of vital importance for the diagnosis of infectious diseases, such as the correct collection of the sample, its transport to the microbiology laboratory and the proper interpretation of the results.

3. COMPETENCIES AND LEARNING OUTCOMES

Core competencies:

- CB1: That students have demonstrated possession and understanding of knowledge in an area of study that builds on the foundation of general secondary education, and is typically at a level that, while relying on advanced textbooks, also includes some aspects that involve knowledge from the cutting edge of their field of study.
- CB2: That students know how to apply their knowledge to their work or vocation in a professional manner and possess the competencies that are usually demonstrated through the elaboration and defense of arguments and problem solving within their area of study.
- CB3: That students have the ability to gather and interpret relevant data (usually within their area of study) to make judgments that include a reflection on relevant social, scientific or ethical issues.
- CB5: That students have developed those learning skills necessary to undertake further studies with a high degree of autonomy.

General competencies:

- CG7 - Ability to promote autonomous learning of new knowledge and techniques, as well as motivation for quality.

- CG11: Ability to understand the basic biomedical sciences on which dentistry is based to ensure proper oral-dental care.
- GC14: Knowledge of general disease processes, including infection, inflammation, immune system alterations, degeneration, neoplasia, metabolic alterations and genetic disorders.
- CG15 - Be familiar with the general pathological characteristics of diseases and disorders affecting organ systems, specifically those with oral repercussions.
- GC16 - Ability to understand the basis 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.
- CG18: Knowledge to critically evaluate and know how to use clinical and biomedical information sources to obtain, organize, interpret and communicate scientific and health information.
- CG19 - Knowledge of the scientific method and critical ability to evaluate established knowledge and new information. To be able to formulate hypotheses, collect and critically evaluate information for problem solving, following the scientific method.

Cross-cutting competencies:

- CT1: Responsibility: The student must be able to assume the consequences of the actions he/she performs and be accountable for his/her own actions.
- CT2 - Self-confidence: That the student is able to act with confidence and with sufficient motivation to achieve his/her objectives.
- CT5: Interpersonal understanding: The student must be able to actively listen in order to reach agreements using an assertive communication style.
- CT7: Teamwork: The student must be able to participate actively in the achievement of a common goal, listening, respecting and valuing the ideas and proposals of the rest of the team members.
- CT8 - Initiative: The student should be able to proactively anticipate and propose solutions or alternatives to the situations presented.
- CT9: Planning: The student should be able to effectively determine goals and priorities by defining the optimal actions, deadlines, and resources required to achieve those goals.

Specific competencies:

- CE1: To know the biomedical sciences on which dentistry is based to ensure proper oral and dental care. These sciences should include appropriate contents of Embryology, anatomy, histology and physiology of the human body, Genetics, Biochemistry, Cellular and molecular biology and Microbiology and immunology.

Learning outcomes:

- RA1: Knowledge of the structure, metabolism and genetics of microorganisms, the main bacteria, fungi, parasites and viruses that cause disease in humans and the infections they produce.
- RA2: Knowledge of the main antimicrobials, their mechanisms of action and general resistance mechanisms.
- RA3: Knowledge of the microbiology of oral infections and their systemic repercussions.
- RA4: Knowledge of the sampling techniques and transport systems used in dentistry and the main procedures and techniques performed in clinical microbiology laboratories.
- RA5: Knowledge of the immune system of the human body.

The table below shows the relationship between the competencies developed in the course and the learning outcomes pursued:

Competencies	Learning outcomes
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CB1, CB2, CB3, CB5, CG7, CG11, CG14, CG15, CG18, CG19, CT1, CT2, CT5, CT8, CT9, CE1	RA1: Knowledge of the structure, metabolism and genetics of microorganisms, the main bacteria, fungi, parasites and viruses that cause disease in humans and the infections they produce.
CB1, CB2, CB3, CB5, CG7, CG11, CG14, CG16, CG18, CG19, CT1, CT7, CT9, CE1	RA2: Knowledge of the main antimicrobials, their mechanisms of action and general resistance mechanisms.
CB1, CB2, CG11, CG14, CG15, CG16, CG18, CG19, CT1, CT5, CE1	RA3: Knowledge of the microbiology of oral infections and their systemic repercussions.
CB1, CG11, CG18, CG19, CT1, CT5, CT9, CE1	RA4: Knowledge of the sampling techniques and transport systems used in dentistry and the main procedures and techniques performed in clinical microbiology laboratories.
CB1, CB5, CG14, CT7, CE1	RA5: Knowledge of the immune system of the human body.

4. CONTENTS

The subject consists of the following lessons:

PART I: INTRODUCTION

- Lesson 1. Microbiology and General Immunology

PART II: IMMUNOLOGY

- Lesson 2. General and specific immunity
- Lesson 3. Antigens and Antibodies
- Lesson 4. Immune response

PART III: GENERAL MICROBIOLOGY

- Lesson 5. Bacterial structure
- Lesson 6. Bacterial Metabolism and Genetics
- Lesson 7. Bacteria: cocci and bacilli
- Lesson 8. Fungi
- Lesson 9. Viruses

PART IV: ANTIMICROBIALS

- Lesson 10. Antimicrobials

PART V: ORAL MICROBIOLOGY

- Lesson 11. Oral microbiology: oral ecology
- Lesson 12. Bacterial plaque: cariogenic and periodontal.

5. TEACHING-LEARNING METHODOLOGIES

The following are the types of teaching-learning methodologies to be applied:

- Master Class
- Case method
- Cooperative learning
- Problem Based Learning (PBL)

6. TRAINING ACTIVITIES

The types of training activities to be carried out and the student's dedication in hours to each of them are identified below:

Presential modality:

Training activity	Number of hours
Tutorials	18 h
Master Classes	24 h
Virtual master classes	8 h
Troubleshooting	8 h
Case analysis	25 h
Laboratory practices	20 h
Self-study and self-employment	45 h
In-person knowledge tests	2 h
TOTAL	150 h

7. EVALUATION

The following is a list of the evaluation systems, as well as their weight in the total grade of the course:

Evaluable block	Evaluation system	Weight
Evidence	Knowledge tests	60%
2. Practices	Laboratory practices	15%
3. Activities	Case/Problem	25%

In the Virtual Campus, when you access the course, you will be able to consult in detail the evaluation activities to be performed, as well as the due dates and evaluation procedures for each of them.

7.1. Ordinary call for applications

In order to pass the course in the ordinary exam, 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 that you obtain a grade greater than or equal to 5.0, independently, in each of the evaluation systems that make up the subject (including the knowledge tests segregated in partial). It may be assessed that the knowledge tests segregated in partial weighted average from a grade equal to or greater than 4.

The Universidad Europea de Valencia establishes continuous assessment as a system of evaluation of knowledge, skills and basic, general, transversal and specific competencies of the degree in Dentistry, in accordance with the provisions of the Regulations for the evaluation of undergraduate degrees. In this regard and for the purposes of the consumption of calls the student should be aware that, if he/she presents any evaluation system provided in the Learning Guide, in the ordinary call the student will have an overall grade of the subject, thus consuming the call.

According to the aforementioned Regulations, students taking face-to-face degree courses are required to justify at least 50% of class attendance, as a necessary part of the evaluation process and in the case of theoretical or practical classes determined as mandatory by the teacher in the schedules of the subject, the student must register an attendance of 90%, whether the absence is justified or not. The lack of accreditation by the means proposed by the University will entitle the professor to grade the subject as failed in the ordinary call, according to the grading system.

As for the obligation to attend 50% of the classes, this must be in person, in the classroom. In other words, attendance will only be considered for those students who are physically present in the classroom, and participation through Hyflex will be considered as "absent".

Punctuality will be taken into account: 3 tardies of more than 15 minutes or early dismissals will be counted as an absence.

The student should consult the schedule of the course in the Virtual Campus for the mandatory classroom sessions.

The mention of "Matrícula de Honor" will be awarded to students who have obtained a grade equal to or higher than 9.0. Their number may not exceed 5% of the students enrolled in each subject in the corresponding academic year, unless the number of students enrolled is less than 20, in which case only one honorable mention may be awarded.

In particular, the evaluation of the subject is divided into three blocks:

- **Block 1. Knowledge examination (60%).** There will be 2 partial tests.
- **Block 2. Laboratory practices (15%).** There will be 7 laboratory practices, 6 of which will be face-to-face and 1 virtual.
- **Block 3. Cases / Problems (25%).** This block is divided into:
 - Immunology cases/problems
 - Antimicrobial cases/problems
 - Bacterial identification project

At the end of this Guide and in the Virtual Campus, detailed information of all the tests and evaluable activities is indicated. The grade for each block will correspond to the weighted average of all the activities included in it. It is necessary to obtain a minimum grade of 5.0 in each block and in each partial knowledge test in order to pass the block and, therefore, the course in the Ordinary Examination.

7.2. Extraordinary call for applications

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 greater than or equal to 5.0 in the final test, so that it can be averaged with the rest of the activities.

The activities that were not passed in the ordinary exam must be handed in, after having received the corresponding corrections from the teacher, or those that were not handed in.

The Universidad Europea de Valencia establishes continuous assessment as a system of evaluation of knowledge, skills and basic, general, transversal and specific competencies of the degree in Dentistry, in accordance with the provisions of the Regulations for the evaluation of undergraduate degrees. In this regard and for the purposes of the consumption of calls the student should be aware that in the extraordinary call will be the Objective Test of Knowledge (POC) which determines whether or not consumes call and in the exceptional case that only has pending to overcome system / s evaluation that are not the POC, will be considered NP if not presented and will get numerical grade if you present at least one of them.

Pursuant to the aforementioned Regulations, students taking face-to-face degree courses are required to justify at least 50% of class attendance, as a necessary part of the evaluation process, and in the case of theoretical or practical classes determined as mandatory by the teacher in the schedules of the subject, the student must register an attendance of 90%, whether the absence is justified or not. Those students who, due to non-compliance with this requirement, must appear in the extraordinary call, must perform as many activities or knowledge tests determined by the teacher to recover this part and its corresponding overcoming based on the specified rubric.

8. CHRONOGRAM

In this section you will find the chronogram with dates for the delivery of evaluable activities of the course:

Evaluable activities	Date
First Knowledge Test	See Virtual Campus
Second knowledge test	See Virtual Campus
Laboratory practices	See Virtual Campus
Virtual simulations	See Virtual Campus
Cases / Problems	See Virtual Campus

This schedule may be subject to modifications due to logistical reasons. Any modification will be notified to the student in due time and form.

9. BIBLIOGRAPHY .

The reference work for the follow-up of the subject is:

- Brock, T.D. (2015). **Biology of microorganisms**. Madrid: Pearson Addison Welsey. 14th edition.
- Abbas, A.K. (2017). **Basic immunology**. Barcelona: Elsevier. 5th edition.
- Rosa Fraile, M de la. (2011). **Microbiology in health sciences. Concepts and applications**. Madrid: Elsevier. 3rd Edition.
- Bagg, J. & Bagg, S. (2006). **Essentials of Microbiology for dental students**. Oxford: Oxford University Press. 2nd edition.

The following is a recommended bibliography:

- Samaranayake, L. (2018). **Essential Microbiology for Dentistry**. Elsevier, 5th edition.
- Negroni, M. (2018). **Stomatologic microbiology. Fundamentals and practical guide**. Buenos Aires: Panamericana, 3rd Ed., 2018.
- Murray, P.R., Rosenthal, K.S., Pfaller, M.A. (2017). **Medical microbiology**, St. Louis: Elsevier-Mosby, 8th Edition.
- Kenneth, J., Ryan, C. (2017). **Sherris, medical microbiology**. México, D.F.: McGraw-Hill Interamericana. 6th ed.
- Liébana Ureña, J. (2002). **Oral microbiology**. Madrid: McGraw-Hill - Interamericana. 2nd edition.

Online resources:

- **Spanish Society of Infectious Diseases and Clinical Microbiology** www.seimc.org
- **American Society for Microbiology** <http://journals.asm.org/>

10. EDUCATIONAL GUIDANCE AND DIVERSITY UNIT

From the Educational Guidance and Diversity Unit (ODI) we offer support to our students throughout their university life to help them achieve their academic achievements. Other pillars of our actions are the inclusion of students with specific educational support needs, universal accessibility in the different campuses of the university and equal opportunities.

This Unit offers students:

1. Accompaniment and follow-up through counseling 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, that is, in terms of methodology and evaluation, for those students with specific educational support needs, thus pursuing equal opportunities for all students.
3. We offer students different extracurricular training resources to develop various competencies that will enrich their personal and professional development.
4. Vocational guidance through the provision of tools and counseling 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.uev@universidadeuropea.es

11. SATISFACTION SURVEYS

Your opinion matters!

Universidad Europea encourages you to participate in satisfaction surveys to detect strengths and areas for improvement about the faculty, the degree program and the teaching-learning process.

Surveys will be available in the survey area of your virtual campus or through your e-mail.

Your assessment is necessary to improve the quality of the degree.

Thank you very much for your participation.