Universidad Europea

1. BASIC INFORMATION

Course	General Microbiology and Immunology
Degree program	Dentistry
School	Faculty of Health Sciences
Year	First year
ECTS	6 ECTS
Credit type	Mandatory
Language(s)	English/Spanish
Delivery mode	Presential
Semester	S2
Academic year	2020/2021
Coordinating professor	Nicla Flacco

2. PRESENTATION

The aim of this course is that students learn basic principles of medical microbiology and general immunology.

Knowledge and management of oral infections are fundamental tools for dentists, allowing them to identify their etiology, to select appropriate antimicrobial agents and to evaluate the effectiveness of the treatment prescribed. In addition, it involves several actions of vital importance for the diagnosis of infectious diseases, such as the correct collection of the sample, its transport to the laboratory of microbiology, and the proper interpretation of the results obtained.

3. COMPETENCIES AND LEARNING OUTCOMES

Core competencies:

- CB1: Students must demonstrate to have gained a better knowledge in the studied field. The basis for these studies come from general secondary education and reach levels that, whilst supported by advanced textbooks, includes some aspects that imply knowledge of the forefront of their field of study.
- CB2: Students must use their knowledge in their work or vocation in a professional manner. They must be able to sustain arguments and solve problems within their field of study.

- CB3: Students may have the ability to gather and interpret relevant data (usually within their field of study) to inform judgments that include reflection of relevant social, scientific or ethical nature.
- CB5: Students will have developed those learning skills needed to undertake further study with a high degree of autonomy.

General competencies:

- CG1: Know the essential elements of the dentist profession, including ethical principles and legal responsibilities.
- CG7: Ability to promote autonomous learning of new knowledge and techniques, as well as motivation for quality.
- CG9 - Ability to understand the importance of keeping records and using patient information for later analysis, preserving the confidentiality of the data.
- CG11: Ability to understand the basic biomedical sciences on which Dentistry is based in order to ensure a correct dental care.
- CG14: Knowledge of the general processes of the disease, including infection, inflammation, alterations of the immune system, degeneration, neoplasia, metabolic disorders and genetic disorders.
- CG15: Knowledge of the general pathological characteristics of the diseases and disorders that affected the organic systems, in order to explore their oral repercussion.
- CG16: Ability to understand the basis of the action, indications and efficacy of drugs and other therapeutic techniques, knowing their contraindications, interactions and systemic effects, as well as the available scientific evidence.
- CG18: Knowledge to assess critically and understand how to use the sources of clinical and biomedical information to obtain, organize, understand and communicate scientific and health information.
- CG19: Knowledge of the scientific method and critical capacity to assess established knowledge and new information. Ability to formulate hypotheses, collect and critically evaluate information to solve problems, following the scientific method.

Cross-curricular competencies:

- CT1: Responsibility: The student must be able to bear the consequences of the actions taken and account for his/her own actions.
- CT2: Self-confidence: The student must be able to act with determination and sufficient motivation to achieve his/her objectives.

- CT5: Interpersonal Understanding: Students will be able to perform active listening in order to reach agreements using an assertive communication style.
- CT7: Teamwork: Students will be able to participate actively in the achievement of a common goal, listening, respecting and valuing the ideas and proposals of the other members of their team.
- CT8: Initiative: The student may be able to pro-actively anticipate, proposing solutions or alternatives to the situations presented.
- CT9: Planning: The student will be able to effectively determine his/her goals and priorities, defining actions, deadlines and optimal resources required to achieve those goals**.**

Specific competencies:

- CE1: Understanding the basic biomedical sciences underlying the Dentistry to ensure proper dental care. These sciences must include appropriate contents of Embryology, Anatomy, Histology and Physiology of the human body, Genetics, Biochemistry, Molecular and Cellular Biology, and Microbiology and Immunology.
- CE02 - Know the morphology and function of the stomatognathic apparatus, including appropriate contents of specific embryology, anatomy, histology and physiology.

Learning outcomes:

- LO1: Knowledge of the structure, metabolism, and genetics of bacteria., as well as of the main bacteria, fungi, parasites and viruses that cause human diseases and the infections they produce.
- LO2: Knowledge of the main antimicrobial agents, their mechanisms of action and associated resistance mechanisms.
- LO3: Understanding of the microbiology of oral infections and their systemic consequences.
- LO4: Knowledge of sampling techniques and transport systems used in dentistry and the main procedures and techniques performed in clinical microbiology laboratories.

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

Competencies	Learning outcomes
CB1, CB2, CB3, CB5, CG7, CG11, CG14, CG15, CG18, CG19, CT1, CT2, CT5,, CT8, CT9, CE1	**LO1:** Knowledge of the structure, metabolism, and genetics of bacteria., as well as of the main bacteria, fungi, parasites and viruses that cause human diseases and the infections they produce.

CB1, CB2, CB3, CB5, CG7, CG11, CG14, CG16, CG18, CG19, CT1, CT7, CT9, CE1	**LO2:** Knowledge of the main antimicrobial agents, their mechanisms of action and associated resistance mechanisms.
CB1, CB2, CG11, CG14, CG15, CG16, CG18, CG19, CT1, CT5, CT9, CE1	**LO3:** Understanding of the microbiology of oral infections and their systemic consequences.
CB1, CG11, CG18, CG19, CT1, CT5, CT9, CE1	**LO4:** Knowledge of sampling techniques and transport systems used in dentistry and the main procedures and techniques performed in clinical microbiology laboratories.

4. CONTENT

The subject is divided in 3 Parts, with the following theoretical contents:

Part I: Immunology

- Lesson 1. Introduction to Microbiology and Immunology
- Lesson 2. Host defense. Innate immunity
- Lesson 3. Host defense. Cellular acquired immunity
- Lesson 4. Host defense. Humoral acquired immunity
- Lesson 5. Alterations of the immune system and immunotherapy

Part II: General Microbiology

- Lesson 6. Structure and metabolism of bacteria
- Lesson 7. Bacterial taxonomy
- Lesson 8. Bacterial pathogenicity
- Lesson 9. Main human pathogens: cocci
- Lesson 10. Main human pathogens: bacilli
- Lesson 11. Main human pathogens: other microorganisms
- Lesson 12. Viruses
- Lesson 13. Fungi
- Lesson 14. Antimicrobial agents

Part III: Oral Microbiology

- Lesson 15. Composition of oral microbial flora and dental plaque
- Lesson 16. Mechanisms of defense of the mouth
- Lesson 17. Caries
- Lesson 18. Periodontal diseases
- Lesson 19. Microbiology of endodontic infection
- Lesson 20. Infections of the salivary glands
- Lesson 21. Infections of the oral mucosa

5. TEACHING-LEARNING METHODOLOGIES

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

- Master classes/Lectures
- Case method
- Cooperative learning
- Problem-based learning (PBL)

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 classes/Lectures	80 h
Laboratory practices	20 h
Case analysis	25 h
Problem resolution	25 h
TOTAL	150 h

7. ASSESSMENT

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

Evaluable block	Assessment system	Weight
1	Tests of knowledge	60%
2	Laboratory practices	15%
3	Evaluable activities	25%

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

To pass the subject in ordinary call you must pass the **continuous evaluation process** of the different activities that, in the general evaluation scheme, appear divided into 3 blocks.

It is essential that **the grade of each evaluable block is equal to or greater than 5**. The student's final grade will be obtained from the weighting of the partial grades of each of the blocks, as indicated in the table and detailed below. In the case of **not having passed** any of the evaluable blocks, the score in the report will always be that of the block with the lowest score.

The evaluation methodology for the 3 blocks may be based on: test questions, short questions, open-ended questions with and without limitation in length, correspondence questions, oral questions, papers, oral presentations, personal reflections, problems, cases, etc.

Here is what you will have to do to overcome each block:

- **Block 1. Test of knowledge (60%):**

Two objective tests will be carried out, each with a weight of 50%. Students could take the second test regardless of whether they have passed the first or not.

In order to maintain the integrative capacity of the students and continuous evaluation, the second test will contain between 10% and 20% of basic content included in the first test.

In each of the two objective tests, the student must obtain a grade of at least 5.0 to pass the block. Once the objective tests of knowledge have been passed, the grade of this block will be the weighted average of the first and second partial (50% and 50% respectively).

- **Block 2. Laboratory practices (15%):**

Attendance at face-to-face laboratory practices and the performance of simulations of virtual laboratory practices are **mandatory** in order to pass this block of knowledge. The evaluation of the practices will be carried out demonstrating the knowledge and skills acquired during the practice sessions. In the virtual campus the evaluation modality of each of these practices will be detailed.

The block grade will correspond to the weighted average of all the activities included. It is necessary to obtain a minimum grade of 5.0 in this block to pass this section and be able to average with the other two blocks of the subject.

• **Block 3. Evaluable activities (25%):**

This section includes the completion of **cases and problems** on Immunology and Microbiology, which will consist of three deliverable activities.

In the virtual campus the evaluation modality of each of these activities will be detailed before their realization.

The block grade will correspond to the weighted average of all the activities included. It is necessary to obtain a minimum grade of 5.0 in this block to pass this section and be able to average with the other two blocks of the subject.

7.2. Second exam period

To pass the subject in extraordinary call you must meet all the requirements set out above for the ordinary call.

8. SCHEDULE

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

Assessable activities	Deadline
Laboratory practices	Check Blackboard
Cases/Problems	Check Blackboard
Tests of knowledge	Check Blackboard

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

Here is the recommended bibliography:

- Bagg, J. & Bagg, S. (2006). **Essentials of Microbiology for dental students**. Oxford: Oxford University Press. 2nd edition.
- Samaranayake, L. (2018). **Essential Microbiology for Dentistry**. Elsevier, 5th edition.
- **American Society for Microbiology** http://journals.asm.org/
- Negroni, M. (2018). **Microbiología Estomatológica. Fundamentos y guía práctica**. Buenos Aires: Panamericana, 3ª Ed., 2018.
- Rosa Fraile, M de la. (2011). **Microbiología en ciencias de la salud. Conceptos y aplicaciones**. Madrid: Elsevier. 3ª Edición.

- Murray, P.R., Rosenthal, K.S., Pfaller, M.A. (2017). **Microbiología médica**, St. Louis: Elsevier-Mosby, 8ª Edición.
- Sherris, J.C., Ryan, K.J., Ray, C.G., Sapiña Renard, S. (2005). **Microbiología médica. Una introducción a las enfermedades infecciosas**. México: McGraw-Hill – Interamericana. 4 edición.
- Liébana Ureña, J. (2002). **Microbiología oral**. Madrid: McGraw-Hill – Interamericana. 2ª edición.
- **Sociedad Española de Enfermedades Infecciosas y Microbiología Clínica** www.seimc.org

10. DIVERSITY MANAGEMENT UNIT

Students with specific learning support needs:

Curricular adaptations and adjustments for students with specific learning support needs, in order to guarantee equal opportunities, will be overseen by the Diversity Management Unit (UAD: Unidad de Atención a la Diversidad).

It is compulsory for this Unit to issue a curricular adaptation/adjustment report, and therefore students with specific learning support needs should contact the Unit at unidad.diversidad@universidadeuropea.es at the beginning of each semester.

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.