Universidad Europea

1. BASIC INFORMATION

Course	Cell Biology and Human Genetics
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	S1
Academic year	2020/2021
Coordinating professor	Nicla Flacco

2. PRESENTATION

With this course students are expected to acquire the methodological skills and conceptual understanding necessary for the study of the cell as the fundamental unit of living beings. The cell is the place where unique vital functions are carried out and integrated, and it reflects pathologies and the response of the living being to internal anomalies and environmental aggressions. The molecular and cytological concepts that form the structural bases of the cell and its processes of proliferation and differentiation are studied, thus allowing the understanding and study of tissues, the next level of organization of living beings. The basic genetic mechanisms associated with cell dynamics are also studied.

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:

- 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 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.
- 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.

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.
- 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.
- 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.
- CE2: Understanding the morphology and function of the stomatognathic apparatus, including appropriate contents of specific embryology, anatomy, histology and physiology.

Learning outcomes:

- LO1: Understanding of the biological, physiological and pathophysiological processes of the human body.
- LO2: Knowledge of cellular components.
- LO3: Knowledge of the processes of cell division and gametogenesis.
- LO4: General knowledge of human genetics and understanding of diseases of genetic origin.
- LO5: Knowledge of the development of molecular tools with current application in dentistry.

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

Competencies	Learning outcomes
CB1, CB5, CG7, CG11, CG18, CT1, CT9, CE1	**LO1:** Understanding of the biological, physiological and pathophysiological processes of the human body.
CB1, CB5, CG7, CG11, CG14, CG18, CT1, CT9, CE1	**LO2:** Knowledge of cellular components.

CB1, CB2, CB5, CG7, CG11, CG18, CT1, CT9, CE1	**LO3:** Knowledge of the processes of cell division and gametogenesis.
CB1, CB2, CB3, CB5, CG7, CG11, CG14, CG18, CT1, CT5, CT7, CT9, CE1	**LO4:** General knowledge of human genetics and understanding of diseases of genetic origin.
CB1, CB2, CB5, CG7, CG11	**LO5:** Knowledge of the development of molecular tools with current application in dentistry.

4. CONTENT

The subject is divided in 2 parts, subdivided in the following lessons:

Part 1: Cell Biology

- Lesson 1. Introduction to Cell Biology
- Lesson 2. Cell membrane
- Lesson 3. Interactions between the cells and the environment
- Lesson 4. Cytoskeleton
- Lesson 5. Protein synthesis and degradation: ribosomes and proteasomes
- Lesson 6. Endoplasmic reticulum
- Lesson 7. Golgi and other membranous organelles
- Lesson 8. Mitochondria
- Lesson 9. Cell nucleus
- Lesson 10. Cell cycle and division. Mitosis
- Lesson 11. Gametogenesis. Meiosis

Part 2: Human Genetics

- Lesson 12. Genome
- Lesson 13. Mendelian genetics
- Lesson 14. Mendelian disorders in humans
- Lesson 15. Genetic polimorphisms
- Lesson 16. Genetic analysis techniques

5. TEACHING-LEARNING METHODOLOGIES

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

- Master classes/Lectures
- 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	90 h
Problem resolution	10 h
Formative evaluation	6 h
Laboratory practices	18 h
Tutorials	26 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	Objective test 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 training 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 evaluation 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, etc.

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

- **Block 1. Knowledge tests (60%):**

Two objective tests will be carried out. The **first** has a weight of 60% and the **second** has a weight of 40%. Students may 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 knowledge tests have been passed, the grade of this block will be the weighted average of the first and second partial (60% and 40% respectively).

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

Attendance at presential 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 carrying out:
- an **Oral Presentation**, which has a weight of 40%
- a Learning Folder, containing:
    - **Genetic problems**, weighing 40%.
    - **Personal reflections**, with a weight of 20%

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 (second exam period) you must meet all the requirements set out above for the ordinary call (first exam period).

8. SCHEDULE

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

Assessable activities	Deadline
Practical laboratory sessions	Check Blackboard
Oral presentation	Check Blackboard
Problem resolution	Check Blackboard
Personal reflections	Check Blackboard
First test of knowledge (Part 1)	Check Blackboard
Second test of knowledge (Part 2)	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 essential recommended bibliography:

- CHANDAR, N. (2010). **Cell and molecular biology.** Philadelphia: Wollters Kluwer Health / Lippincott Williams & Wilkins.

- ALBERTS, B. (2015). **Molecular biology of the cell.** New York; Abindgog UK: Garland Science, cop. 6th edition.

- KLUNG, W.S. (2019). **Concepts of genetics**. NY: Editorial Pearson. 12th edition.

Complementary recommended bibliography:

- LODISH H. (2008). **Molecular Cell Biology**. New York: W.H. Freeman. 6th edition.

- KREBS, J.E. (2018). **Lewin's Genes XII.** Burlington, MA: Jones & Bartlett Learning.

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.