

26702 - Biology

Syllabus Information

Academic year: 2023/24

Subject: 26702 - Biology

Faculty / School: 104 - Facultad de Medicina
229 - Facultad de Ciencias de la Salud y del Deporte

Degree: 304 - Degree in Medicine
305 - Degree in Medicine

ECTS: 6.0

Year: 1

Semester: First semester

Subject type: Basic Education

Module:

1. General information

Biology aims to provide the student with the most important concepts of cell biology, inheritance and human genome. It is focused on transmitting a deep knowledge of the cell on which the contents of other subjects of the Degree will be based. The purpose is that the student acquires, through the integration of all of them, a complete knowledge of the morphology, structure and function of the human body in the different stages of life.

The aim is to convey to the student the need and interest in acquiring this knowledge due to the importance of biomedical research in the development of today's medicine.

Its approach and objectives are aligned with Sustainable Development Goal 3 (SDG) of the United Nations 2030 Agenda, Health and Wellness

2. Learning results

In order to pass this subject, the students shall demonstrate they has acquired the following results:

- Is able to describe and analyse the structure and function of the eukaryotic cell as the fundamental basis of the tissues that constitute the human body.
- Is able to explain the basic principles of heredity, the organization of the human genome and its functional activity. Is able to understand and recognize the molecular basis of disease at the cellular level.
- Is able to integrate the knowledge acquired with that of other first year subjects (Histology, Biochemistry, Physiology)
- Is able to know, critically evaluate and know how to use biomedical information sources.
- Is able to make a critical analysis of those issues and new knowledge that have social relevance in the current context of Biology.

3. Syllabus

- Plasma membrane: Chemical composition and structure.
- Membrane specializations. Cell adhesion and extracellular matrix.
- Permeability and transport across the membrane
- Molecule transport. Endocytosis-exocytosis.
- Cellular communication. Signal transduction.
- Cytoskeleton: Microfilaments. Intermediate filaments. Microtubules.
- Cytosol. Ribosomes.
- Endomembrane system: Endoplasmic reticulum. Golgi apparatus.
- Lysosomes. Peroxisomes.
- Mitochondria.
- Interphase nucleus.
- Cell Cycle.
- Apoptosis.
- Cell differentiation.
- Stem cells.
- Molecular anatomy of the gene.

- Genetic and epigenetic basis of inheritance.
- Regulation of gene expression.
- Molecular basis of cancer.

4. Academic activities

- Theoretical classes
- Interpretation of electron microscopy images: It relates cellular ultrastructure and function.
- Genetics problem solving: The difficulties encountered after having been worked on by the student will be resolved in class.
- Laboratory practices: The objective is to become proficient in the use of the optical microscope and to be initiated in methods of study the cell.
- Biomedical seminars: To motivate scientific research by addressing current issues related to the subject.

The student will be informed about the possible risks during the practices and will sign a commitment to comply with the safety rules (<http://uprl.unizar.es/estudiantes.html>)

5. Assessment system

1. **Theory:** There will be two written tests with multiple-choice questions and/or short development questions, evaluating the capacity of expression, synthesis and relation of concepts (80% of the final grade).
2. **Laboratory practices:** Students with more than two absences will be required to take an exam. Passing it is mandatory.
3. **Cell ultrastructure practices (Electron Microscopy):** They will be evaluated by means of a written test of identification of different cellular structures, complementing (20%) the grade of the midterm exam of theory. It is passed with a minimum grade of 5 / 10.
4. **Genetics problem solving practices:** They will be evaluated by means of a test in which students will solve different problems and practical cases, complementing (20%) the grade of the partial exam of theory. It is passed with a minimum grade of 5 / 10.
5. **Presentation of seminars and complementary tasks:** Their preparation will be valued as well as the expository capacity of each student . It is mandatory and adds up to 1 point to the final grade.

FINAL EXAM: Students who do not eliminate topics through the exams or cannot follow continuous evaluation must take a final exam of the whole subject (minimum grade of 5 / 10). In each of the tests, both theoretical (80%) and practical (10% + 10%), a minimum of 4 / 10 is required for averaging. Tests not performed will be scored with zero points.