

### **IDENTIFICATION DETAILS**

Degree:	Biomedicine		
Scope	Biology and Genetics		
Faculty/School:	Experimental Sciences		
Course:	CELL BIOLOGY		
Туре:	Basic Training	ECTS credits:	6
Year:	1	Code:	2131
Teaching period:	First semester		
Subject:	Biologics		
Module:	Fundamental Sciences		
Teaching type:	Classroom-based		
Language:	Spanish		
Total number of student study hours:	150		

#### SUBJECT DESCRIPTION

The subject of Cell Biology provides students with basic knowledge of the structural and functional properties of cells. In particular, it is intended that the student knows the structure and function of each organelle and compartment of the eukaryotic cell and the interrelation between them to carry out cellular functions, as well as the capacity for relationship and coordination between cells in multicellular organisms.

This course is integrated into the Fundamental Sciences module, whose educational objective is to lay the necessary foundations for later obtaining a solid and integrated knowledge of biomedicine.

The subject of Cell Biology is intended for the student to understand the composition and functioning of the eukaryotic cell, as well as the mechanisms of interaction with the environment and of responding to changes in its environment. In addition, it is intended that he be able to apply his knowledge to other fields of biomedicine and to be trained as the professional that today's society needs and expects.

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The specific aims of the subject are:

Know the composition of the eukaryotic cell and the function of the different organelles.

Understand the mechanisms of interaction with the environment and of responding to changes in the conditions of that environment.

Learn the location, function and physiological importance of the main molecules of the eukaryotic cell.

### PRIOR KNOWLEDGE

The student who accesses the subject should have a good basic background in biology and chemistry. Especially knowledge about the nature of carbohydrates, lipids, proteins and nucleic acids, which will allow you to approach the knowledge that is included in the subject. In particular, it would be desirable for students to have taken the course of Biology in the 2nd year of high school. It is also very advisable for the student to have a good level of English that allows them to keep track of the specific bibliography of the subject.

## **COURSE SYLLABUS**

I. INTRODUCTION TO CELL BIOLOGY. TOPIC 1. INTRODUCTION. II. INTERNAL ORGANIZATION OF THE EUKARYOTIC CELL. TOPIC 2. CELL MEMBRANES. TOPIC 3. MEMBRANE TRANSPORT. TOPIC 4. THE CORE. TOPIC 5. SYNTHESIS, MATURATION AND DEGRADATION OF PROTEINS IN THE CYTOSOL. TOPIC 6. THE ENDOPLASMIC RETICULUM. TOPIC 7. INTRACELLULAR TRANSPORT OF VESICLES. TOPIC 8. CELLULAR METABOLISM. TOPIC 9. THE CYTOSKELETON. **III. CELL REGULATION.** TOPIC 10. CELL SIGNALING. TOPIC 11, CELL CYCLE and DIVISION. TOPIC 12. CELL DEATH AND RENEWAL. TOPIC 13. CANCER.

IV: LABORATORY PRACTICES.

PRACTICE 1. Structure and operation of the optical microscope

PRACTICE 2. Observation of bacteria and yeasts

PRACTICE 3. Cell culture techniques: cell counting and viability

PRACTICE 4. Observation of animal cells under an optical microscope and a fluorescence microscope

PRACTICE 5. Observation of mitosis in onion root

PRACTICE 6. Observation of meiosis in liris

# **EDUCATION ACTIVITIES**

Exhibition class

Participatory master class on the subject indicated in the Teaching Guide

**Practical Classes** 

- Exercises and case studies. Cooperative (or individual) work class in small groups and with the guidance and help of the teacher; different practical tasks related to the contents studied will be carried out: carrying out exercises, tests, and games.

- Experimental laboratory work. There will be 4 practical sessions during which techniques and methodologies specific to experimentation in cell biology will be used, following the practice script provided previously. Tutorials

Tutorial action system by carrying out individual and group tutoring, teachers will answer questions raised during autonomous study.

Theoretical study

Students will have in the Virtual Classroom the subject of study material such as presentations, links to web pages, videos and review exercises.

Preparation of practical classes, tutoring and work

Presentation of individual or group works

## DISTRIBUTION OF WORK TIME

TEACHER-LED TRAINING ACTIVITIES	INDIVIDUAL WORK
60 Horas	90 Horas

#### LEARNING RESULTS

Know the different laboratory instruments and materials (biological and non-biological) and their obtaining and handling for different purposes, observing the necessary safety principles.

Know the basic morphological, metabolic, physiological and genetic characteristics of both prokaryotic and eukaryotic living organisms, taking into account their morphological and functional unit.

## SPECIFIC LEARNING RESULTS

Know the different laboratory instruments and materials (biological and non-biological) and their obtaining and manipulation for different purposes, observing the necessary safety principles.

Know the basic morphological, metabolic, physiological and genetic characteristics of living organisms, both prokaryotic and eukaryotic, taking into account their morphological and functional unit.

### LEARNING APPRAISAL SYSTEM

The evaluation of the subject will be carried out as follows:

(65%) Evaluation of the theoretical content of the subject through oral or written tests with development, short answer or test-type questions.

It will be mandatory to get a minimum of 5 so that you can measure the rest of the grades in the course.

(15%) Carrying out and solving exercises and practical cases, and other activities involving compulsory attendance and participation in the classroom.

(20%) Realization and evaluation of the experimental work carried out in the laboratory. In this practical part of the course, the following will be evaluated:

- Laboratory practice work: behavior, skills and interest (30%) - - Laboratory notebook (40%)

- Tests on the concepts and procedures learned (30%)

All internships are mandatory to pass the course.

It is necessary to get at least a 5 in the practical part to average with the rest of the grades in the course.

If you have not passed the subject in the first call, the grades of the approved parts will be saved until the extraordinary call.

Second enrollment and subsequent students may take advantage of an alternative evaluation system and for this purpose they must contact the teacher at the beginning of the course.

Plagiarism, as well as the use of illegitimate means in evaluation tests, will be sanctioned in accordance with those established in the Evaluation Regulations and the University's Coexistence Regulations

## ETHICAL AND RESPONSIBLE USE OF ARTIFICIAL INTELLIGENCE

1.- The use of any Artificial Intelligence (AI) system or service shall be determined by the lecturer, and may only be used in the manner and under the conditions indicated by them. In all cases, its use must comply with the following principles:

a) The use of AI systems or services must be accompanied by critical reflection on the part of the student regarding their impact and/or limitations in the development of the assigned task or project.

b) The selection of AI systems or services must be justified, explaining their advantages over other tools or methods

of obtaining information. The chosen model and the version of AI used must be described in as much detail as possible.

c) The student must appropriately cite the use of AI systems or services, specifying the parts of the work where they were used and describing the creative process followed. The use of citation formats and usage examples may be consulted on the Library website(<u>https://www.ufv.es/gestion-de-la-informacion\_biblioteca/</u>).

d) The results obtained through AI systems or services must always be verified. As the author, the student is responsible for their work and for the legitimacy of the sources used.

2.- In all cases, the use of AI systems or services must always respect the principles of responsible and ethical use upheld by the university, as outlined in the <u>Guide for the Responsible Use of Artificial Intelligence in Studies at UFV</u>. Additionally, the lecturer may request other types of individual commitments from the student when deemed necessary.

3.- Without prejudice to the above, in cases of doubt regarding the ethical and responsible use of any AI system or service, the lecturer may require an oral presentation of any assignment or partial submission. This oral evaluation shall take precedence over any other form of assessment outlined in the Teaching Guide. In this oral defense, the student must demonstrate knowledge of the subject, justify their decisions, and explain the development of their work.

# **BIBLIOGRAPHY AND OTHER RESOURCES**

#### Basic

Bruce Alberts Molecular Biology of the Cell. Seventh edition 2022

(Bruce Alberts Molecular Biology of the Cell. Seventh edition 2022, Editorial WW Norton||Bruce Alberts... [et al.]; with problems by John Wilson, Tim Hunt. Molecular biology of the cell/6th ed. New York: W.W. Norton & Company, 2015.)

by John J. Coveyau; design, Tomasz Bogusz. Cytosis [Mixed Material]: a Cell Biology game/2nd ed. Madrid:Masqueoca, [s.a]

Harvey Lodish... [et al.]. Cell and Molecular Biology/7th ed. Madrid:Editorial Médica Panamericana, 2016. (Harvey Lodish... [et al.]. Cell and Molecular Biology/7th ed. Madrid:Editorial Médica Panamericana, 2016. , ||Cooper, Geoffrey M. The Cell/7th ed. Madrid:Marbán, 2017. )

Harvey Lodish... [et al.]. Cell and Molecular Biology [Electronic Resource]/7th ed. Madrid: Editorial Médica Panamericana, 2016.

Calvo González, Alfonso. Biomedical cell biology/Barcelona: Elsevier, 2015.

Calvo González, Alfonso. Biomedical cell biology [Electronic resource]/Barcelona: Elsevier, 2015.

Karp, Gerald. Cell and Molecular Biology: Concepts and Experiments/8th ed. Mexico: McGraw-Hill, 2019. (Karp, Gerald. Cell and Molecular Biology: Concepts and Experiments/8th ed. Mexico: McGraw-Hill, 2019. , ||Bruce Alberts Molecular Biology of the cell. Seventh edition 2022 )

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