



COURSE DETAILS

"CELLULAR AND MOLECULAR BIOLOGY"

SSD BIO/11

DEGREE PROGRAMME: AGRI-ENVIRONMENTAL AND FOOD BIOTECHNOLOGY

ACADEMIC YEAR 2021-2022

GENERAL INFORMATION – TEACHER REFERENCES

TEACHER: MARIA LUISA CHIUSANO

PHONE: +39 (0)81 2539492

EMAIL: CHIUSANO@UNINA.IT

GENERAL INFORMATION ABOUT THE COURSE

INTEGRATED COURSE (IF APPLICABLE):

MODULE (IF APPLICABLE):

CHANNEL (IF APPLICABLE):

YEAR OF THE DEGREE PROGRAMME: I

SEMESTER: I

CFU: 6

REQUIRED PRELIMINARY COURSES (IF MENTIONED IN THE COURSE STRUCTURE “ORDINAMENTO”)

Taking into account the heterogeneity of previous education of the students undertaking the specialist degree course in Agro-Environmental and Food Biotechnology, the main educational objective of the Cellular and Molecular Biology course aims to provide an overall adequate and mature knowledge for understanding the mechanisms and the processes at the basis of the functionality of biological systems and their evolution. It aims to provide an analytical and critical view of the issues under study that prepares to face the specialist training that characterize the entire course of study.

To this end, the training project aims to transmit the main and necessary knowledge regarding the structural and functional organization of eukaryotic and prokaryotic cells, the main differences and common aspects, focusing on the structure and function of the biological macromolecules that organize and operate in the cells and the main mechanisms and processes which they preside over in the different cellular systems under study. This training will allow the understanding of the main cellular and biomolecular processes underlying the life, growth, development and adaptation of eukaryotic and prokaryotic organisms, and to prepare the cognitive bases to learn the principles and methodologies of modern biotechnological applications and the most innovative techniques in the sector.

EXPECTED LEARNING OUTCOMES (DUBLIN DESCRIPTORS)

Knowledge and understanding

The student must demonstrate knowledge of the structural and functional characteristics of eukaryotic and prokaryotic cells, their main properties, differences and common aspects, with particular attention to the structural organization of the biological macromolecules that constitute them and the main functional processes which they preside over in the different cellular systems under study. He/she will therefore have to demonstrate the understanding of the chemical-physical, biomolecular and evolutionary aspects that determine the cellular processes underlying the life, growth, development and adaptation of eukaryotic and prokaryotic organisms and of their complexity. The student must demonstrate the ability to understand and argue with an adequate critical attitude and with an appropriate technical-scientific language the aspects and issues related to the topics described, as well as the data and inherent information deriving from other studies or results of applications of experimental or bioinformatics methodologies.

Applying knowledge and understanding

The student must be able to use an appropriate technical-scientific language to argue on the issues addressed. He/she must be able to critically describe results from experiments and/or specialized studies, highlighting the properties and characteristics of the molecules, processes and techniques that have allowed the implementation of the studied procedures. The student must be able to identify the most suitable methodologies to face and solve analytical problems in cellular and molecular biology and must be able to hypothesize/comment cause and effect of specific biological phenomena or experimental designs.

COURSE CONTENT/SYLLABUS

2FC:

Eukaryotic and prokaryotic cells

Physicochemical properties of biomolecules and biopolymers

Protein Structure and Function

Nucleic Acids Structure. The main discoveries in molecular biology

1FC:

Cell cycle and differentiation

Reproduction (Asexual and sexual)

3FC:

DNA organization in prokaryotes and in eukaryotes

DNA Replication in prokaryotes and in eukaryotes

Gene expression: control and regulation. Gene organization. Transcription (mRNA, tRNA, rRNA) in prokaryotes and in eukaryotes. Protein synthesis in prokaryotes and in eukaryotes

Biosequences and Biological Data Banks

READINGS/BIBLIOGRAPHY

- Slides from the course (available from the teacher)
- Materials from Internet (supported and driven by the teacher)
- Books:

Essential of Molecular Biology (Zanichelli) Allison

Molecular Biology of the Gene (Zanichelli) Watson et al.

Molecular Biology (Mac Graw Hill) Robert F. Weaver

TEACHING METHODS

Describe how teaching activities are deployed: lectures, classes, exercises, laboratory, stages, seminars, others. If applicable also list tools for teaching delivery (recorded lectures, multimedia, software, on line material, etc.)

EXAMINATION/EVALUATION CRITERIA

a) Exam type:

Exam type	
written and oral	x
only written	
only oral	
project discussion	
other	

In case of a written exam, questions refer to:	Multiple choice answers	
	Open answers	x
	Numerical exercises	

b) Evaluation pattern:

[this field needs to be filled in only when there are different weights among written and oral exams, or among modules if this refers to an integrated course]