



UNIVERSITÀ DEGLI STUDI DI PALERMO

DEPARTMENT	Scienze e Tecnologie Biologiche, Chimiche e Farmaceutiche
ACADEMIC YEAR	2019/2020
BACHELOR'S DEGREE (BSC)	BIOTECHNOLOGIES
SUBJECT	MOLECULAR BIOLOGY
TYPE OF EDUCATIONAL ACTIVITY	A, B
AMBIT	50077-Discipline biologiche 50078-Discipline biotecnologiche comuni
CODE	01639
SCIENTIFIC SECTOR(S)	BIO/11
HEAD PROFESSOR(S)	CAVALIERI VINCENZO Professore Associato Univ. di PALERMO
OTHER PROFESSOR(S)	
CREDITS	10
INDIVIDUAL STUDY (Hrs)	170
COURSE ACTIVITY (Hrs)	80
PROPAEDEUTICAL SUBJECTS	
MUTUALIZATION	
YEAR	2
TERM (SEMESTER)	1° semester
ATTENDANCE	Not mandatory
EVALUATION	Out of 30
TEACHER OFFICE HOURS	<p>CAVALIERI VINCENZO Monday 14:00 15:00 Dipartimento di Scienze e Tecnologie Biologiche, Chimiche e Farmaceutiche, Viale delle Scienze, Edificio 16, piano 0, Studio Prof. Cavalieri, oppure in remoto tramite piattaforma Microsoft Teams. N.B.: si riceve tutti i giorni esclusivamente per appuntamento da concordare via email: vincenzo.cavalieri@unipa.it</p>

DOCENTE: Prof. VINCENZO CAVALIERI

PREREQUISITES	In order to understand the aims and significance of the Molecular Biology course, the student should know the basic principles regarding Chemistry, Organic chemistry, Cytology, Mathematics and Physics. In particular, the student should know the structure, reactivity, and chemical interactions of atoms and biological molecules in aqueous solution, the thermodynamic rules of biological systems, as well as the cellular architecture and functioning of the subcellular compartments.
LEARNING OUTCOMES	The student will know in-depth the structure and function of biological informational macromolecules (DNA, RNA and proteins), and the molecular mechanisms that regulate the flow of biological information in living organisms. On this basis, the students will be able to: 1) study and apply their expertise on the subject by means of specific literature consultation, 2) develop an autonomy of judgment by critical analysis of scientific articles regarding the topics included in the course, 3) harmonize the topics and correlate them to those of other courses, 4) improve their communication skills through the acquisition of the scientific terminology in the specific field.
ASSESSMENT METHODS	Learning is evaluated individually by means of an interview. During such an oral exam the students must answer at least four questions concerning the topics listed in the program, showing that they have both adequate knowledge of general and specific contents, and critical skills, as well as clarity. The evaluation of the exam is expressed as a grade of out of 30, and it is deemed insufficient whether the student shows inability to focus on the issues proposed, highly incomplete knowledge, and extreme inadequateness in the talk. The sufficiency threshold (18/30) is reached when the student shows argumentation ability, knowledge and understanding of the topics at least in their general lines. The evaluation score increases proportionally with the degree of specific knowledge demonstrated by the student. The full mark (30/30 cum laude) is obtained in the case of excellent mastery and critical analysis of the course contents, coupled to clarity and appropriate use of the scientific terminology.
EDUCATIONAL OBJECTIVES	The student will acquire knowledge on the structure and function of biological informational macromolecules (DNA, RNA and proteins) and the molecular mechanisms that regulate the flow of biological information in living organisms. In particular, the student will be able to critically discuss and relate the mechanisms involved in the duplication, repair, recombination and transposition of genetic material, the mechanisms accounting for transcription, processing and translation of genetic information, as well as the mechanisms underlying regulation of gene expression.
TEACHING METHODS	Frontal lectures
SUGGESTED BIBLIOGRAPHY	<ul style="list-style-type: none"> - Biologia Molecolare (III edizione) - Amaldi et al., Ed. Ambrosiana - Biologia Molecolare - Cox et al., Ed. Zanichelli - Biologia Molecolare - Craig et al., Ed. Pearson - Biologia Molecolare del Gene (VII edizione) - Watson et al., Ed. Zanichelli - Biologia Molecolare - Zlatanova et al., Ed. Zanichelli - Genomi 4 - Brown, Ed. EdiSES

SYLLABUS

Hrs	Frontal teaching
20	Historical origins of Molecular Biology and main discoveries concerning nucleic acids; chemical composition, canonical- and alternative-structural parameters, and topology of nucleic acids.
10	Organization of genomes, packaging of DNA in prokaryotic and eukaryotic chromosome, chromatin dynamics.
15	Enzymology and replication mechanisms of the prokaryotic and eukaryotic genome, molecular mechanisms of genome maintenance (DNA damage repair, recombination, gene conversion), mobile elements and transposition mechanisms.
10	Genetic elements, enzymes and RNA transcription mechanisms in prokaryotes and eukaryotes.
8	RNA processing and modification mechanisms in prokaryotes and eukaryotes.
8	Decoding and translation cycle of the genetic information in prokaryotes and eukaryotes.
5	Molecular strategies for the regulation of gene expression in prokaryotes and eukaryotes.
4	Post-transcriptional regulation mechanisms of gene expression, outline of epigenetics and regulatory RNAs.