



UNIVERSITÀ DEGLI STUDI DI PALERMO

DEPARTMENT	Scienze della Terra e del Mare		
ACADEMIC YEAR	2020/2021		
BACHELOR'S DEGREE (BSC)	NATURAL AND ENVIRONMENTAL SCIENCE		
INTEGRATED COURSE	GENETICS AND MICROBIOLOGY - INTEGRATED COURSE		
CODE	18030		
MODULES	Yes		
NUMBER OF MODULES	2		
SCIENTIFIC SECTOR(S)	BIO/18, BIO/19		
HEAD PROFESSOR(S)	QUATRINI PAOLA	Professore Associato	Univ. di PALERMO
OTHER PROFESSOR(S)	CORONA DAVIDE	Professore Associato	Univ. di PALERMO
	QUATRINI PAOLA	Professore Associato	Univ. di PALERMO
CREDITS	9		
PROPAEDEUTICAL SUBJECTS			
MUTUALIZATION			
YEAR	2		
TERM (SEMESTER)	2° semester		
ATTENDANCE	Not mandatory		
EVALUATION	Out of 30		
TEACHER OFFICE HOURS	CORONA DAVIDE		
	Monday	09:00 12:00	Dipartimento STEBICEF Viale delle Scienze - Edificio 16
	Tuesday	09:00 12:00	Sede del Consorzio Universitario, corso Vittorio Emanuele, 92, 93100 Caltanissetta
	QUATRINI PAOLA		
	Thursday	10:00 12:00	Studio Docente Viale delle scienze ed 16. tel 09123897320. Chiamare per conferma.

DOCENTE: Prof.ssa PAOLA QUATRINI

PREREQUISITES	Basic knowledge of biology and organic chemistry.
LEARNING OUTCOMES	The students of the course will acquire cultural knowledge and skills in the field of formal and molecular genetics and general microbiology; the acquisition of a basic scientific preparation regarding the biochemical and molecular aspects, functional and evolutionary genes and genomes. The acquisition of knowledge of morphology, structure, organization and gene expression of the prokaryotic and eukaryotic microorganisms. Knowledge of the role of microorganisms in nature and of interactions with multicellular organisms. The students of the course will have acquired a theoretical and experimental knowledge of the basic and advanced concepts of Genetics and Microbiology that will allow them both to deepen and specialize in Master's degree courses or to spend this knowledge directly in the world of work Students will acquire the ability to critically read a scientific paper evaluating the validity of the results described in relation to the approach methodology used and to have personal opinions on the topics covered. Students will acquire critical skills and presentation skills for dissemination of scientific knowledge with particular attention to the use of the appropriate technical terminology. The learning skills will be complemented by the ability to search in the web, consult databases and critically analyze the scientific literature also in English.
ASSESSMENT METHODS	Learning is assessed by means of a final exam in the form of a written test (multiple choice quiz and open questions) and an individual interview if the student, upon reaching sufficiency, chooses to improve the outcome of the written test evaluation. In the written test, the student will have to answer questions related to topics developed during the course, demonstrating that they have adequate knowledge and interpretative competence of general and specific contents, one ability to link and process content. . During the oral exam the students will have to answer at least three questions, concerning the topics developed during the course, demonstrating that they have adequate knowledge and interpretative competence of general and specific contents, the ability to link and process content, as well as the ability to expose the knowledge in a clear and correct way. Evidence assessment comes expressed in thirtieths. The final evaluation of the written test will be given by the sum of the scores assigned to each correct answer. The evaluation of the oral exam will be formulated on the basis of the following considerations: 1) Sufficient knowledge of the covered topics and limited capacity of elaboration and presentation of the subjects of the discipline (Vote 18-21). 2) Good knowledge of the topics discussed and good processing skills and exposition of the subjects of the discipline (vote 22-24) 3) Extensive knowledge of the topics dealt with and deeper knowledge of elaboration and presentation of the subjects of the discipline (vote 25-27) 4) Excellent knowledge of the topics discussed, excellent processing skills And exposition of the subjects of the discipline (vote 28-30) 5) Excellent knowledge of the topics discussed, excellent ability of elaboration and exposition of the subjects of the discipline (vote 30 and LODE).
TEACHING METHODS	Lectures and training

MODULE GENETICS

Prof. DAVIDE CORONA

SUGGESTED BIBLIOGRAPHY

Snustad e Simmons – Principi di Genetica, Ed. Edises
Peter J. Russel - iGENETICS A Molecular Approach - Ed Pearson

AMBIT	10703-Attività formative affini o integrative
INDIVIDUAL STUDY (Hrs)	102
COURSE ACTIVITY (Hrs)	48

EDUCATIONAL OBJECTIVES OF THE MODULE

The Genetics module aims at providing the student with basic knowledge on the inheritance of genetic traits and on the molecular mechanisms responsible for transmitting the genetic information in prokaryotic and eukaryotic organisms.

SYLLABUS

Hrs	Frontal teaching
24	Principles of genetic transmission . Segregation of alleles and independent assortment . multiple , dominant alleles . Atypical Mendelian ratios and variability of gene expression . Inheritance associated with sex . Mendelian genetics in humans : family trees , association maps . physical basis of association : crossing-over and recombination . frequency of recombination and gene order . genetic maps , cytogenetic maps and physical maps . The Genome projects , organization of databases , and supporting tools .
24	The flow of genetic information , and organization of the genome : Complementation , cistron and gene concept . General aspects of replication . Protein synthesis and the genetic code . Structure of prokaryotic and eukaryotic chromosomes . Structure and organization of the eukaryotic genome . Multigene families : origin and evolution. Evolutionary Genetic elements . Extranuclear inheritance : structure and expression of the mitochondrial DNA and chloroplast .

MODULE MICROBIOLOGY

Prof.ssa PAOLA QUATRINI

SUGGESTED BIBLIOGRAPHY

-Biologia dei microrganismi, a cura di G. Deho' e E. Galli, Casa Editrice Ambrosiana
-Madigan M.T., Martinko J.M.: Brock. Biologia dei Microrganismi vol.1, CEA-Casa Editrice Ambrosiana, Milano..
- articoli proposti e diapositive mostrate durante il corso.

AMBIT	10703-Attività formative affini o integrative
INDIVIDUAL STUDY (Hrs)	47
COURSE ACTIVITY (Hrs)	28

EDUCATIONAL OBJECTIVES OF THE MODULE

The course provides theoretical and practical information on the structure, physiology and genetics of microorganisms and on their role in ecosystems and the environment

SYLLABUS

Hrs	Frontal teaching
6	General characteristics of prokaryotic and eukaryotic microbes, Bacteria Archaea, yeasts and molds. Organization, structure and physiology. General characteristics of viruses
6	Nutritional requirements of microorganisms. Microbial growth and metabolism. Energy and carbon sources. General principles of metabolism: anabolism and catabolism Chemolithotrophy: Environmental factors that influence the growth of microorganisms (temperature, pH, salinity, light, oxygen).
4	Microbial Ecology: Host microbes interactions. The microbiota concept. The role of microbes in the environment: biogeochemical cycles (C, N).

Hrs	Practice
6	Methods of microbiology. Cultivation of microbes. Methods of sterilization, general and selective media, enrichment culture; isolation in pure culture. Antibigram, Gram staining; measures of microbial growth: total and vital counts
6	Identification of microorganisms using traditional and molecular methods. PCR analysis and elements of bioinformatics for bacterial taxonomy and phylogeny