



UNIVERSITÀ DEGLI STUDI DI PALERMO

DEPARTMENT	Promozione della Salute, Materno-Infantile, di Medicina Interna e Specialistica di Eccellenza "G. D'Alessandro"		
ACADEMIC YEAR	2023/2024		
BACHELOR'S DEGREE (BSC)	NURSING		
SUBJECT	APPLIED BIOLOGY AND GENETICS		
TYPE OF EDUCATIONAL ACTIVITY	A		
AMBIT	10304-Scienze biomediche		
CODE	11666		
SCIENTIFIC SECTOR(S)	BIO/13		
HEAD PROFESSOR(S)	BARRECA MARIA MAGDALENA	Professore a contratto	Univ. di PALERMO
OTHER PROFESSOR(S)			
CREDITS	3		
INDIVIDUAL STUDY (Hrs)	45		
COURSE ACTIVITY (Hrs)	30		
PROPAEDEUTICAL SUBJECTS			
MUTUALIZATION			
YEAR	1		
TERM (SEMESTER)	1° semester		
ATTENDANCE	Mandatory		
EVALUATION	Out of 30		
TEACHER OFFICE HOURS	BARRECA MARIA MAGDALENA Tuesday 11:00 13:00 La modalita', orario e luogo di ricevimento sara' comunque concordato tramite email.		

DOCENTE: Prof.ssa MARIA MAGDALENA BARRECA

PREREQUISITES	The prerequisites are those required at national level in order to access to Courses for Health Professions. In fact, to be admitted to the course of NURSING, perspective students must pass a mandatory access competition based on tests that also include questions related to biology.
LEARNING OUTCOMES	Knowledge and understanding - Acquisition of the specific language of Biology and Genetics topics; - to Know and understand the basic biological processes of living organisms and the way in which hereditary characteristics are transmitted to the offsprings; - to know and understand the genetic basis of the most common human diseases or those diseases with an high incidence in the territory. Applying knowledge and understanding Ability to distinguish, organize and implement, in a independent way: - the knowledge of basic biological processes of cells and organisms; - The laws which regulate the transmission of hereditary characteristics in living species; - The main methods of cell biology and molecular genetics. Making judgments Being able to evaluate and integrate, in an autonomous manner: - The acquired knowledge in biology and genetics in the study of organisms and in particular man; -the consequences of the alterations of biological processes on human diseases. Communication skills Ability to communicate and explain, in a simple way, even to a non-expert public, the biological and genetic processes. Learning ability Ability to properly use the scientific literature for a continuous update of knowledge in the biomedical field. Ability to learn and follow appropriately, using the knowledge acquired in the course, the subsequent teaching courses of the curriculum for the final degree in Nursing.
ASSESSMENT METHODS	There will be a test of the duration of 60 minutes including 22 question with multiple choices (a-e) and 2 open questions about biology and genetic topics. Each multiple choice question will be valued +1 (exact) or 0 (wrong) while each open question will receive a score from 0 to 4 with 4 the highest score and 0 the lowest score. The summation of the results will be the final mark. The test could be followed by an oral examination usually lasting 10 minutes. The questions tend to verify a) the knowledge gained, and b) the ability of elaborative and synthesis skills. As for the assessment of knowledge, it will be required the ability to contextualize the topic within a specific cellular process illustrating the properties and characteristics of the molecule and / or biological activity. As for the verification of the elaborative abilities, it will be evaluated the ability to extrapolate the minimum details of the process in a clear and concise manner and the understanding of their implications for the topic. The evaluation scheme is the following: 30-30 e Lode: A-A+ Excellent: more than good acquisition of the course content and excellent language abilities and synthesis abilities 27-29: B Very good: very good knowledge of the issues and good language abilities; the student is very able to correlate the different topics which has studied 24-26: C Good: good knowledge of the issues and good language abilities; the student is able to correlate the different topics which has studied 21-23: D Satisfactor: just enough knowledge of the subject, and limited language 18-20: E Sufficient : minimum basic knowledge of the subject requested and poor elaborative capacity 1-17: F Fail: insufficient knowledge of the contents required by the specific question or the student does not answer.
EDUCATIONAL OBJECTIVES	Distinguish viruses, prokaryotic and eukaryotic cell. Identify the main biological structures, the organization and functioning of a eukaryotic cell. Analyze the flow of the genetic information and the mechanisms of gene expression in prokaryotes and eukaryotes. Analysis and comparison of genomic stability and variability. Main mutation type. Understanding genetic inheritance modes and genotype-phenotype relationship. Genetic inheritance in humans. Modes of transmission of Wild Type and mutated genes.
TEACHING METHODS	Lessons in the classroom
SUGGESTED BIBLIOGRAPHY	Bonaldo, Crisafulli, D'angelo, Francolini, Grimaudo, et Al., "Elementi di Biologia e Genetica" Edises Editore. H.Curtis e al. "Le basi della biologia" (cellula, genetica, evoluzione), Zanichelli Editore.

	David Hillis, David Sadava, Craig Heller, Mary Price "Elementi di Biologia e Genetica", Zanichelli Editore. N. A. Campbell, J.B. Reece "Biologia e Genetica" Pearson Editrice.
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SYLLABUS

Hrs	Frontal teaching
4	Biological macromolecules: phospholipids, protein and nucleic acid structures and functions.
4	Structural and functional cell organization. Prokaryotic and eukaryotic cells. Cytoplasm: organization and functional examples.
2	Human gene and genome organization. DNA replication.
4	"Transcription" and maturation of eukaryotic mRNA. The genetic code. Protein synthesis.
4	Cell cycle, mitosis. Meiosis and gametogenesis in humans.
4	Mendelian inheritance rules: dominant and recessive phenotypes, Law of Segregation, Law of Independent Assortment. Punnett square. Non-Mendelian inheritance: co-dominance, incomplete dominance, multiple alleles, polygenic traits
4	Human genetics: genotype and phenotype. Genetic inheritance in humans. Modes of transmission. Chromosomal and genomic aberrations.
4	Genotype and phenotype relationship: penetrance and expressivity, allelic and non allelic heterogeneity. Genetic mosaicism: X-inactivation. Examples of inheritance disease.