



## FUNDATIONS OF BIOLOGY AND GENETICS

Enrollment year	2021/2022
Academic year	2021/2022
Regulations	DM270
Department	DEPARTMENT OF ELECTRICAL, COMPUTER AND BIOMEDICAL ENGINEERING
Course	BIOENGINEERING
Curriculum	Cellule, tessuti e dispositivi
Year of study	1°
Period	1st semester (27/09/2021 - 21/01/2022)
ECTS	6
Language	Italian

The activity is split

500134 - **GENERAL BIOLOGY**

500136 - **HUMAN GENETICS**



### GENERAL BIOLOGY

Enrollment year	2021/2022
Academic year	2021/2022
Regulations	DM270
Academic discipline	BIO/06 (COMPARATIVE ANATOMY AND CYTOLOGY)
Department	DEPARTMENT OF ELECTRICAL, COMPUTER AND BIOMEDICAL ENGINEERING
Course	BIOENGINEERING
Curriculum	Cellule, tessuti e dispositivi
Year of study	1°
Period	1st semester (27/09/2021 - 21/01/2022)
ECTS	3
Lesson hours	23 lesson hours
Language	Italian
Activity type	ORAL TEST
Teacher	REBUZZINI PAOLA - 3 ECTS
Prerequisites	
Learning outcomes	The course consists of two modules, both conducted in the first half year. The module of General Biology precedes that of Human Genetics.
Course contents	<p>The module aims to provide the basic principles of human genetics.</p> <p>Module of Cell Biology</p> <p>The objective of this module is to provide the basis of structure and function of cells. The course focused on the characteristics of cells.</p> <p>Structure of the eukaryotic cell: relation between form and function. Plasma membrane.</p> <p>Structure and function of cellular organelles: the vacuolar apparatus (nuclear envelope, rough and smooth endoplasmic reticulum, Golgi</p>

	<p>apparatus, lysosomes), mitochondria, cytoskeleton.</p> <p>Brief introduction on tissues.</p>
<b>Teaching methods</b>	<p>Lectures (hours/year in lecture theatre): 23</p> <p>Practical class (hours/year in lecture theatre): 0</p> <p>Practicals / Workshops (hours/year in lecture theatre): 0</p>
<b>Reccomended or required readings</b>	Colombo e Olmo: BIOLOGIA -CELLULA E TESSUTI. EdiErmes
<b>Assessment methods</b>	<p>Oral exam.</p>
<b>Further information</b>	
<b>Sustainable development goals - Agenda 2030</b>	<a href="#">\$lbl_legenda_sviluppo_sostenibile</a>



### HUMAN GENETICS

Enrollment year	2021/2022
Academic year	2021/2022
Regulations	DM270
Academic discipline	BIO/18 (GENETICS)
Department	DEPARTMENT OF ELECTRICAL, COMPUTER AND BIOMEDICAL ENGINEERING
Course	BIOENGINEERING
Curriculum	Cellule, tessuti e dispositivi
Year of study	1°
Period	1st semester (27/09/2021 - 21/01/2022)
ECTS	3
Lesson hours	23 lesson hours
Language	Italian
Activity type	ORAL TEST
Teacher	OLIVIERI ANNA (titolare) - 3 ECTS
Prerequisites	For the specific purposes of the Human Genetics unit the student should have acquired through the regular attendance of the Biology unit, some basic concepts of cell structure, cell cycle and its regulation, mitosis and meiosis.
Learning outcomes	<p>The course aims to provide students with the basics for understanding the cellular and tissue biology and genetics with special reference to man. For this purpose it is structured in two Units: Biology and Human Genetics.</p> <p>The unit of Human Genetics aims to provide the basics of: the mendelian genetics, the molecular organization of the genes in relation to the organization of the genome, the origin of the genetic variability, the control of gene expression, the genetic control the processes of cell differentiation and animal development, the main techniques of molecular analysis of genes and genomes, the fundamentals of genetic</p>

	engineering.
<b>Course contents</b>	<p>Unit of Human Genetics</p> <p>Mendelism: the basic principles of heredity and extensions of Mendelism.</p> <p>The chromosomal basis of Mendelism. Human karyotype, changes in the chromosome number and structure.</p> <p>Association, crossing over and chromosome maps in eukaryotes and humans.</p> <p>DNA mutation, recombination and repair.</p> <p>Techniques of molecular genetics. Genomics. Applications of molecular genetics and genomics.</p> <p>Defining the concept of the gene with particular reference to human genes.</p> <p>Regulation of gene expression in eukaryotes.</p> <p>Genetic control of the cell cycle: the genetic basis of cancer.</p> <p>Genetic control of differentiation and animal development.</p>
<b>Teaching methods</b>	<p>Both units are conducted in the first half of the semester. The unit of Biology precedes the Human Genetics one.</p> <p>Lectures (hours/year in lecture theatre): 23</p> <p>Practical class (hours/year in lecture theatre): 0</p> <p>Practicals / Workshops (hours/year in lecture theatre): 0</p> <p>The student has at Kiro's site:  <a href="http://elearning2.unipv.it/engineering/course/index.php?categoryid=13">http://elearning2.unipv.it/engineering/course/index.php?categoryid=13</a>,  PDFs of lesson material , additional teaching materials and written test exercises.</p>
<b>Reccomended or required readings</b>	<p>Michael R. Cummings. Eredità principi e problematiche della genetica umana. EDISES, 2014.</p> <p>Michael R. Cummings. Human Heredity: Principles and Issues, 11th Edition.. 2016, Brooks/Cole Cengage Learning.</p>
<b>Assessment methods</b>	<p>Exam mode: Oral. The student will be interviewed on the topics covered during the Human Genetics lectures. We ask the student to know and understand the topics, as well as acquire a proper vocabulary</p>
<b>Further information</b>	<p>for further information <a href="mailto:anna.olivieri@unipv.it">anna.olivieri@unipv.it</a></p>
<b>Sustainable development goals - Agenda 2030</b>	<p>Some of the topics in this course are in line with the 2030 Agenda for Sustainable Development, even if marginally, in particular with Goal 15 - Protect, restore and promote sustainable use of terrestrial ecosystems / halt biodiversity loss.</p> <p><a href="#">\$lbl legenda sviluppo sostenibile</a></p>