



GENERAL PHYSIOLOGY

Enrollment year	2020/2021
Academic year	2021/2022
Regulations	DM270
Academic discipline	BIO/09 (PHYSIOLOGY)
Department	DEPARTMENT OF BIOLOGY AND BIOTECHNOLOGY "LAZZARO SPALLANZANI"
Course	BIOLOGICAL SCIENCES
Curriculum	PERCORSO COMUNE
Year of study	2°
Period	1st semester (01/10/2021 - 14/01/2022)
ECTS	9
Lesson hours	72 lesson hours
Language	Italian
Activity type	WRITTEN AND ORAL TEST
Teacher	BIELLA GERARDO ROSARIO (titolare) - 6 ECTS MOCCIA FRANCESCO - 3 ECTS
Prerequisites	Basic knowledge in Mathematics, Physics and Chemistry.
Learning outcomes	This course shall provide a comprehensive introduction to human physiology from cells to organs to the organism. At the end of this course, the student will have a detailed knowledge of the general arrangement of many of the body's organ systems, in particular the nervous, locomotor, cardiovascular, respiratory, and urinary system.
Course contents	Part 1 (6 credits). Elements of cell physiology. Structure and function of the plasma membrane. Passive and active transport mechanisms. Ionic channels. General mechanisms of signal transduction through the plasma membrane. Ionic bases of action potential and its properties. Synaptic transmission. Neurotransmitters. Cell motility and muscle contraction. Sensory

receptors. Reflexes. General sensibility and sensory pathways, Posture and movement control. The cerebellum. Cerebral cortex functions. Electrical and mechanical activity of the heart. The control of the strength and frequency of heart contraction. Principles of hemodynamics. The control of blood pressure and cardiac output. Part 2 (3 credits). Principles of physiology of the respiratory apparatus. Respiration mechanics. Lung volumes and capacities. Alveolar ventilation and gas exchanges. Roles of the respiratory apparatus in acid-base equilibrium. Control of respiration. Principles of physiology of the kidney. Glomerular filtration. Tubular transports: reabsorption and secretion mechanisms. The countercurrent multiplication mechanism. Mechanisms of urine concentration and dilution. Hydro-saline balance and regulation mechanisms thereof. Roles of the kidney in acid-base equilibrium.

Teaching methods

The course is organized in lectures using Power Point presentations and the blackboard. During the lessons problems will be proposed to the students to verify their learning of the theoretical concepts presented and whose solution will be shown during the next lessons.

Reccomended or required readings

- 1) On line slides of the course at the web page:
<http://www-3.unipv.it/tslmra22/>
- 2) Casella-Taglietti; Principi di Fisiologia; Ed. La Goliardica Pavese
- 3) Rhoades-Pflanzer; Fisiologia Umana; Ed. Piccin.

Assessment methods

For each module the examination of learning consists in a written test with problems followed by an oral examination about arguments of the module.

Further information

Further information concerning the program of the course and lecture presentations are available at Prof. Toselli web page:
www-1.unipv.it/tslmra22/.

Sustainable development goals - Agenda 2030

[The goals](#)