

Course Title	PHYSIOLOGY			
Course Code	SSPHY102-1			
Course Type	MANDATORY			
Level	BSc (Level 1)			
Year / Semester	1st / Spring			
Teacher's Name	Dr Savvas Ioannou			
ECTS	6	Lectures / week	3	Laboratories/week
Course Purpose	<p>The main objectives of the course are for students to understand the physiological functions and homeostatic mechanisms of the human body according to their systems. In addition, the aim of the course is for students to understand the general rules governing the multifaceted and complex functional interdependence of the various systems of the human body as well as to learn the physiological parameters of operation and possible physiological deviations at the level of the cell, tissue, organ and functional system.</p>			
Learning Outcomes	<p>Upon completion of the course, students will be able to:</p> <ul style="list-style-type: none"> • know and describe physiological functions and mechanisms • consolidate the mechanisms of interregulation of the human body and delimit any deviations from normal • know the function of nerve and muscle cells and tissues • understand the physiology of the respiratory, cardiovascular, nervous, musculoskeletal, and endocrine systems • understand the principles of physiology in the digestive and urinary system • are able to describe the regulation of acid-base balance, temperature, blood sugar and blood pressure • describe the structure and function of the lymphatic system • understand the differences in the types of muscle contraction and the regulatory role of the nervous system • understand the functional interdependence of the respiratory and cardiovascular systems • describe the role of the sensorimotor system and its relationship with proprioception and balance regulation 			
Prerequisites	No	Corequisites	No	
Course Content	<ul style="list-style-type: none"> • Introduction to Physiology. Cells, tissues, organs, organ systems. The internal environment and homeostasis. • Transmembrane transport of solutes and water. Structure and composition of the membrane. Endocytosis and exocytosis. Diffusion. Osmosis. Protein-mediated membrane transport – active and facilitated transport. 			

	<ul style="list-style-type: none"> • Nervous system. Organization of the nervous system. Central and peripheral system. Composition of nerve tissue and microscopic structure of neurons. Transmission of information. • Synapses. Neuromuscular connections. Resting membrane potential and the creation and conduction of energy potentials. Synaptic transmission. • General aesthetic system. Principles of sensory physiology – sensory receptors, stimulus, sensory coding (type and location of stimulus). • Special senses – visual system. Eye structure and normal optics. Visual disturbances. • The autonomic nervous system and its regulation. Sympathetic and parasympathetic system. Autonomic functions and functions of the hypothalamus. • Muscles. Structure of muscle tissue. The unit of contraction. The circle of cross-sectional bridges of actin-myosin. Isometric and isotonic contractions. Regulation of contraction and relaxation. Skeletal and smooth muscle. • The locomotor system. The motor unit – motor neurons. Synaptic integration and production of energy potentials. Muscle receptors, interstitial neurons of the spinal cord and spinal reflexes. • The control of posture and movement by the brainstem. Organization of descending motor pathways. Control of movement from the cortex, cerebellum, and basal ganglia. • Blood. Components of blood. Leukocytes, lymphocytes, and blood groups. Hemostasis – vasoconstriction, platelet clot and blood clotting. • Circulation and cardiovascular system. The electrical activity of the heart – cardiac energy potential, conduction in cardiac fibers and cardiac excitability. Natural stimulation of the heart and return. Electrocardiography. • The heart pump – anatomical basis of cardiac function. Cardiac muscle cells, heart cavities and valves. Heart sounds and heart cycle. Measurement of cardiac output. Adjusting the heartbeat. • The arterial system. Factors that determine blood pressure. Measurement of blood pressure in humans. • The respiratory system. Respiratory function and pulmonary ventilation. Transport of blood gases and gas exchange in tissues. Breath control system. Transport of oxygen and carbon dioxide between lungs and body cells. • Renal function. Anatomy of the kidneys. Determination of renal function – glomerular filtration, reabsorption of substances from the tubular fluid into the blood and the excretion of substances from the blood into the tubular fluid. • The role of the kidneys in acid-base balance. • Digestive system. Structure and innervation of the gastrointestinal tract. Control of gastrointestinal motility. Gastrointestinal smooth muscle. • General principles of physiology of the endocrine system. Synthesis, storage, and secretion of hormones. Hormonal action. • Reproductive function. Synthesis and regulation of secretion of sex steroid hormones. Age-related changes in reproduction and racial variation. Reproductive function of male and female.
Teaching Methodology	<p>Theory The teaching of the course includes lectures on the offer of the theoretical background. The teaching uses detailed notes with PowerPoint and material</p>

	<p>rich in images and videos. Methods such as case studies, real scenarios, discussion, questions/answers are used in the teaching methodology depending on the course's nature. Relevant material published in international scientific journals is also used to follow the latest developments related to the subject of the course</p>
Bibliography	<ul style="list-style-type: none"> • Widmaier, E., Raff, H. and Strang, K.T. (2016) Vander's Φυσιολογία του Ανθρώπου. Εκδόσεις Broken Hill • Guyton, A.C. (2001). Φυσιολογία του ανθρώπου (Μετ: Ευαγγέλου, Α. & Κούβελας, Η.). Ιατρικές Εκδόσεις Λίτσας. Αθήνα. • Hall J. (2020). Guyton and Hall Textbook of Medical Physiology, 14th Edition, Elsevier • McGeown, J.G. (2008). Συνοπτική Φυσιολογία του Ανθρώπου. Εκδόσεις Πασχαλίδης. • Berne, R.M. & Levy, M.N. (2004). Physiology Principles (Greek edition), Crete Editions. • Σμοκοβίτης, Α. (2004). Φυσιολογία. Εκδόσεις Κυριακίδη. Θεσσαλονίκη. • Scott W. (2004) Anatomy & Physiology Made Incredibly Easy. (2nd Edition). Lippincott Williams & Wilkins, USA.
Assessment	<p>Continuous evaluation (50%):</p> <p>The assessment shall include a combination of the following:</p> <ul style="list-style-type: none"> • Paper presentation (20%) related to Human Physiology which provides opportunities for students to apply their theoretical knowledge in a practical way. The work is designed in a way that requires critical thinking, research, analysis, and synthesis of information. Students are assessed on the quality of their work, the depth of understanding they demonstrate and their ability to effectively explain their ideas to an audience. The Work is teamwork. Then, peer evaluation is carried out where students are assigned to review and provide feedback on others' work, encouraging them to critically evaluate their fellow students' understanding and provide constructive suggestions. • Online quizzes or interactive assessments (30%): Online quizzes, or interactive assessments, can be used through the Moodle platform to create quizzes with various question formats. These assessments are timed, and immediate feedback can be provided to students. • Class discussions: Students participate in class discussions to assess their theoretical knowledge. Active participation is encouraged to hone their critical thinking skills, ask open-ended questions, and facilitate their dialogue. <p>Final exam (50%): Comprehensive final exam to assess students' overall theoretical knowledge. These assessments cover a wider range of topics and learning outcomes from across the curriculum, to assess students' understanding and integration of knowledge in various areas.</p>
Language	Greek / English