**COURSE OUTLINE**

1. **GENERAL**

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| **SCHOOL** | School of Health Sciences |
| **ACADEMIC UNIT** | Faculty of Medicine |
| **LEVEL OF STUDIES** | Undergraduate |
| **COURSE CODE** | ΙΑΥ302 | **SEMESTER** | **D** |
| **COURSE TITLE** | **PHYSIOLOGY III** |
| **INDEPENDENT TEACHING ACTIVITIES** *if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits* | **WEEKLY TEACHING HOURS** | **CREDITS** |
| Lectures and laboratory exercises | 12 | 7 |
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| *Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (4).* |  |  |
| **COURSE TYPE***general background, special background, specialised general knowledge, skills development* | General Background |
| **PREREQUISITE COURSES:** |  |
| **LANGUAGE OF INSTRUCTION and EXAMINATIONS:** | GREEK |
| **IS THE COURSE OFFERED TO ERASMUS STUDENTS** | YES |
| **COURSE WEBSITE (URL)** | <https://ecourse.uoi.gr/enrol/index.php?id=1878> |

1. **LEARNING OUTCOMES**

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| **Learning outcomes** |
| *The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.**Consult Appendix A* * *Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area*
* *Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B*
* *Guidelines for writing Learning Outcomes*
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| The course serves as the foundation for understanding the organization and functioning of the central and peripheral nervous systems, sensory organs, and the endocrine system. The anatomical-functional cooperation of the above, i.e., the neuroendocrine system, ensures the integrated processing of stimuli from the internal and external environments, as well as the regulation and control of voluntary and autonomic (reflexive) responses in the human body.The course content introduces medical students to the concepts of the normal functioning of the nervous and endocrine systems, as well as the characteristic pathological deviations that are the targets of therapeutic treatment and interventions aimed at restoring the body to its normal state. Physiological mechanisms are explored in detail at the molecular, cellular, systemic, and organ levels, through which all sensory stimuli and information are received, processed, controlled, and lead to responses via the neuroendocrine system to all other systems of the body. Sensory (mechanoreceptive, chemoreceptive, proprioceptive) and sensory functions (vision, hearing, taste, smell), movement, balance, body posture, musculoskeletal coordination, the autonomic regulation of circulatory, respiratory, urogenital, and digestive system functions, metabolism and nutrition, stress mechanisms, higher brain functions (consciousness, thought, emotion, memory, learning), and states (alertness, sleep, dreaming) are analyzed in depth, with an emphasis on both general principles and the specific circuits and neuro-hormonal axes that govern physiological function.The ultimate goal of the course is to understand the integrated neuroendocrine function in maintaining body homeostasis, the mechanisms that support it, and an introduction to selected pathological deviations and the possibilities for restoring them to normal functioning.Upon successful completion of the course, the student will be able to:* Understand the functional role of the morphological characteristics of nerve cells, as well as the way graded potentials and nerve impulses are generated.
* Understand the functional characteristics and physiological significance of the circuits and mechanisms of the nervous and endocrine systems.
* Roughly assess the sensory-motor state of the body, the reactions of the neuromuscular-skeletal system, the function of sensory organs, the metabolic state of the organism, and the phases of the reproductive cycle with the help of specific tests and methods.
* Use specialized instruments (audiometer, ophthalmoscope, perimeter, neurological hammer, skinfold caliper, body fat analyzer, kinesthesiometer, sensory assessment with Frey disk), as well as simulation programs.
* Analyze and interpret measurement data of physiological parameters assessing neuroendocrine function obtained through specific tests from their own body, classmates, and simulation exercises in a digital environment.
* Distinguish mechanisms that are disrupted and cause specific pathological conditions as well as the possibilities of restoring them to normal homeostasis.
* Collaborate with classmates in exchanging knowledge, exercising critical thinking, solving theoretical and methodological problems, and fostering team spirit in addressing medical problems.
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| **General Competences**  |
| *Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim?* |
| *Search for, analysis and synthesis of data and information, with the use of the necessary technology* *Adapting to new situations* *Decision-making* *Working independently* *Team work**Working in an international environment* *Working in an interdisciplinary environment* *Production of new research ideas*  | *Project planning and management* *Respect for difference and multiculturalism* *Respect for the natural environment* *Showing social, professional and ethical responsibility and sensitivity to gender issues* *Criticism and self-criticism* *Production of free, creative and inductive thinking**……**Others…**…….* |
| * Decision-making
* Autonomous work
* Teamwork
* Promotion of free, creative, and inductive reasoning
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1. **SYLLABUS**

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| The nervous system's structure, organization, and function include the morphology and function of neurons, synapses, and neurotransmitters, as well as the function, sensitivity, and classification of sensory receptors and nerve fibers. Reflex circuits, such as myotatic and tendon reflexes, are essential, along with the functional characteristics of nociception. Sensory and motor pathways are examined, alongside the cytoarchitecture and activity of the cortex, sleep, wakefulness, and circadian rhythms. Higher cortical functions, such as language centers, memory, and learning, are explored. The physiological role of the extrapyramidal system in posture, support, and body balance is addressed, along with the basal ganglia's function and associated disorders. The brainstem and vestibular organ, as well as the cerebellum's functional anatomy, histology, circuits, roles, and related disorders, are thoroughly analyzed.Sensory organs and sensory functions are also covered, including the eye, principles of optics, retinal function, visual pathways and fields, color vision, eye adaptations, and refractive abnormalities. Hearing is discussed with a focus on the principles of acoustic physics, cochlear and Corti organ function, and central auditory integration. Additional topics include speech, smell, and taste.The functional characteristics of the autonomic nervous system (ANS) involve the hypothalamus and its control and regulatory functions over various systems, including the circulatory, respiratory, digestive, urinary, and reproductive systems, along with stress mechanisms.The introduction to the physiology of the endocrine system encompasses the biochemistry and mechanisms of hormone action, as well as the principles of molecular and cellular endocrinology. The hypothalamic-pituitary system and its connection to the central nervous system are explained. The functions and regulation of pituitary hormones are discussed, alongside the metabolic hormones of the thyroid, including their production, functions, and secretion regulation. Iodine metabolism is addressed, as well as thyroid disorders such as hyperthyroidism and hypothyroidism. Adrenal cortex hormones, including mineralocorticoids and glucocorticoids, are examined in terms of their functions and secretion regulation, with emphasis on the hypothalamic-pituitary-adrenal axis. Glucose homeostasis is analyzed, highlighting insulin and the metabolism of carbohydrates, fats, and proteins, along with the regulation of insulin, glucagon, and blood glucose levels. The pathophysiology of diabetes mellitus is also discussed.Calcium homeostasis is detailed, including the actions of parathyroid hormone, vitamin D, and calcitonin, along with conditions such as osteoporosis. The role of androgens is explained, as well as basal metabolism and the role of leptin in regulating food intake. Lastly, obesity and body composition are assessed, including the distribution of body fat. |

1. **TEACHING and LEARNING METHODS - EVALUATION**

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| **DELIVERY***Face-to-face, Distance learning, etc.* |  Face-to-face lectures and laboratory exercises |
| **USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY** *Use of ICT in teaching, laboratory education, communication with students* | Power point presentationsEducational videosQuizzes on Microsoft FormsPhysio-Ex simulation program |
| **TEACHING METHODS***The manner and methods of teaching are described in detail.**Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc.**The student's study hours for each learning activity are given as well as the hours of non-directed study according to the principles of the ECTS* |

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| ***Activity*** | ***Workload of each students group***  |
| Lectures | 52 |
| Laboratory practice | 40 |
| Study and analysis of bibliography, essay writing, interactive teaching | 30 |
| Student's study hours | 88 |
| Total Workload | 210 |

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| **STUDENT PERFORMANCE EVALUATION***Description of the evaluation procedure**Language of evaluation, methods of evaluation, summative or conclusive, multiple choice questionnaires, short-answer questions, open-ended questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory work, clinical examination of patient, art interpretation, other**Specifically-defined evaluation criteria are given, and if and where they are accessible to students.* | Written exams:* multiple choice questionnaires
* short-answer questions
* open-ended questions
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1. **ATTACHED BIBLIOGRAPHY**

**Guyton and Hall Textbook of Medical Physiology, 14th Edition**