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| **Module card** | | | | | | | | | | |
| I. GENERAL INFORMATION | | | | | | | | | | |
| **WITELON COLLEGIUM STATE UNIVERSITY**  **DEPARTMENT FACULTY OF HEALTH AND PHYSICAL CULTURE SCIENCES** | | | | | | | | | | |
| **Field of study:** | | | Physiotherapy (master studies) | | | | | | | |
| **Form of study:** | | | Erasmus | | | | | | | |
| **Module title:** | | | Human physiology and exercise physiology | | | | | | | |
| **Module type:** | | | Full-time studies | | | | | | | |
| **Language of lecture:** | | | English | | | | | | | |
| **Year of study:** | | Year 2, semester 3 | **Forms of teaching including number of teaching hours:** | | | | | | | |
| **Semester (winter/summer):** | | winter | Lectures | Classes | Laboratory | Project | Workshop | Seminar | | Self-study |
| **Total number of ECTS credits:** | | 5 | 7 |  | 13 |  |  |  | | 60 |
| **Form of completion:** | | | Final examination | | | | | | | |
| **Prerequisites:** | | | - | | | | | | | |
| II. LEARNING OBJECTIVES | | | | | | | | | | |
| **Learning objectives:** | | | | | | | | | | |
| **Objective 1:** Understand vital physiological processes and mechanisms in particular cells, tissues, organs and organ systems in normal conditions and be able to explain the mechanisms of regulation of physiological functions.  **Objective 2:** To understand how the properties of each physiological system support the ability to human organism to adaptation | | | | | | | | | | |
| IV. PROGRAMME CONTENT | | | | | | | | | | |
| **Content of the programme (topics of classes, presented with a breakdown into individual forms of classes**  **with the indication of the number of hours needed for their realization)** | | | | | | | | | | |
| **\*\*** | | | | | | | | | | |
| Code | Course topics in theory | | | | | | | | Number of hours | |
| 1 | Homeostasis and its maintenance. Methods of intercellular communication. | | | | | | | | 1 | |
| 2 | Types and function of muscles in the human body. | | | | | | | | 1 | |
| 3 | Central nervous system – sensory and motor function. Higher functions of brain. | | | | | | | | 1 | |
| 4 | Thermoregulation. Autonomic nervous system: classification, mediators, receptors and their agonists and antagonists. Effect of the sympathetic and parasympathetic systems on organs and tissues | | | | | | | | 1 | |
| 5 | Physiology of blood. Formed elements of blood: reference values and functions. Blood types. | | | | | | | | 1 | |
| 6 | Physiology of heart – phases of cardiac cycle, heart sounds, volumes and pressure of cardiac chambers. Internal and external regulation of heart function. Action of the cardiovascular system Regulation of the arterial blood pressure and vascular resistance. | | | | | | | | 1 | |
| 7 | Function of the respiratory system. Ventilation of lungs. Compliance of lungs Respiratory resistance. Spirometry. Regulation of the respiratory system. | | | | | | | | 1 | |
| \*\* | | | | | | | | | | |
| Code | Course topics in practice | | | | | | | | Number of hours | |
| 1 | Adaptation of the heart and the cardiovascular system to physical exercise. Assessment of SV, HR, Q. ECG. Adaptation of the respiratory system to physical exercise. | | | | | | | | 1 | |
| 2 | Muscles and training. | | | | | | | | 1 | |
| 3 | General physical efficiency and methods of its assessment. Maximum oxygen uptake (VO2max, oxygen threshold). | | | | | | | | 2 | |
| 4 | The use of tests in the assessment of cardiovascular fitness (Martinett test, Harvard test, Ruffier test). | | | | | | | | 1 | |
| 5 | Anaerobic efforts. Cardiovascular responses to static and strength efforts. - Comparison of HR, RR changes during local and global efforts. - Valsalva's working conditions, observation of Lindhard's paradox. | | | | | | | | 1 | |
| 6 | Physiological characteristics of restitution. Physical performance and exercise tolerance. Types and importance of rest. Post-workout metabolism. Repayment of oxygen debt. Factors supporting the elimination of fatigue changes. Study of changes in hemodynamic indicators during the period of restitution. | | | | | | | | 1 | |
| 7 | Anaerobic threshold as an indicator of the effectiveness of endurance training. The importance of systematic physical activity in the prevention of certain metabolic disorders and cardiovascular diseases. Conconi test. | | | | | | | | 1 | |
| 8 | Assessment of anaerobic capacity. The importance of warming up. Wingate test; | | | | | | | | 1 | |
| 9 | Physiology in hypokinesia. Changes in the function of the circulatory system, respiration, blood composition and water and electrolyte balance during immobilization. Orthostatic intolerance. Impact of immobilization on skeletal muscles and the osteoarticular system. Crampton's Test. | | | | | | | | 1 | |
| 10 | Health training. | | | | | | | | 2 | |
| 11 | Aging and physiology. | | | | | | | | 1 | |
| VIII. RECOMMENDED LITERATURE | | | | | | | | | | |
| **Basic sources:**  1. Textbook of Medical Physiology – Arthur C. Guyton, John E. Hall. 14th edition. Elsevier 2021. [Guyton And Hall Textbook Of Medical Physiology, 14ed 2021 : John E hall Micheal E hall : Free Download, Borrow, and Streaming : Internet Archive](https://archive.org/details/guyton-and-hall-textbook-of-medical-physiology-14ed)  2. Exercise Physiology. For health, fitness and performance - Denise L. Smith, Sharon A. Plowman, Michael J. Ormsbee. Sixth edition.Wplters Kluwer 2023. [Exercise physiology for health, fitness, and performance : Plowman, Sharon A : Free Download, Borrow, and Streaming : Internet Archive](https://archive.org/details/exercisephysiolo0000plow) | | | | | | | | | | |
| **Additional sources:**  1. Human Physiology – Dee U. Silverthorn. San Francisco : Pearson/Benjamin Cummings 2004 [Human physiology : an integrated approach : Silverthorn, Dee Unglaub, 1948- : Free Download, Borrow, and Streaming : Internet Archive](https://archive.org/details/humanphysiology00deeu/page/n31/mode/2up) | | | | | | | | | | |