**ACADEMIC DISCIPLINE OVERVIEW**

1. **Program data**

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| **1.1.** | **GRIGORE T. POPA UNIVERSITY OF MEDICINE AND PHARMACY IASI** |
| **1.2.**  | **FACULTY OF MEDICAL BIOENGINEERING**  |
| **1.3.** | **PROGRAMME:** Physio-kinetotherapy and rehabilitation |
| **1.4.**  | **STUDY FIELD:** Health |
| **1.5.** | **STUDY CYCLE**: UNDERGRADUATE |
| **1.6.** | **STUDY PROGRAMME:** INENGLISH |
| 1. **Subject data**
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| **2.1.** | **Subject: ERGOPHYSIOLOGY –RE1112** |
| **2.2.** | **Module leader: Lecturer Matei Daniela Viorelia, Ph-D** |
| **2.3.** | **Seminar leader: Lecturer Matei Daniela Viorelia Ph-D** |
| **2.4. Year of study** | **1** | **2.5. Semester in which is taught** | **2** | **2.6. Evaluation type** | Exam | **2.7. Subject status** | Mandatory DS |

1. **Estimated total time (hours/semester of didactic activity)**

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| **3.1.Number of hours / week** | 2 | **3.2. Courses number of hours / week** | 1 | **3.3.Seminar / l practical classes** | 1 |
| **3.4. Total number of learning hours** | 28 | **3.5. Courses** | 14 | **3.6. Seminar / practical classes** | 14 |
| **3.7. Distribution of the available time** | Hours |
| **Study based on the manual, lecture support, bibliography and hand notes** | 16 |
| **Supplementary documentation in the library, using specialised platforms via internet and by field work** | 4 |
| **Preparation for seminars / practical classes, study themes, reviews, portofolio, and essays** | 2 |
| **Tutorship** | 4 |
| **Examinations** | 2 |
| **Other activities** |  |
| **3.8. Total hours of individual study** | 22 |
| **3.9. Total hours pes semester** | 50 |
| **3.10. Number of credits** | 2 |

1. **Preconditions (where applicable)**

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| **4.1.** of curriculum | Anatomy, Physiology |
| **4.2.** of competences | Knowledge of communication means between basic units of living matter and extracellular environment |

1. **Conditions (where applicable)**

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| **5.1.** for lectures | Video logistic support |
| **5.2.** for seminars / practical classes | Students need to wear protection equipment (white coats) |

1. **Specific competences acquired**

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| Professional competences (expressed as knowledge and abilities) | C1.2 formulating hypotheses and operationalization of key concepts needed to explain diseases and/or syndromes.C3.1 Identification of the physiological mechanisms of thermo-regulation, effects of thermic factors on the human body’s systems: identification of the hydro thermal therapy (HTT) techniques, considering the indications, counter-indications and precautions.C4.1 Description of electrotherapy techniques, they application parameters, indications, counter-indications, ways of working for the machines providing the electrical charge and the derived forms of energy..C4.2 Applying basic knowledge to explain and interpretation of the electrotherapy procedures |
| Transverse competences (of role, of professional development, personal) | Identifying roles and responsabilities in a multidisciplinary team.Application of relationship techniques. Efficiency in teamwork and in patient relationship |

1. **Objectives of the study discipline (according to the grid of specific competences acquired)**

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| **7.1.** General objective | - Acquisition of theoretical and practical knowledge on general adaptation and structures involved in effort- Understanding specific muscular adaptation and their relationship with the type of effort. |
| **7.2.** Specific objectives | - Knowledge on the biological factors responsible for the individual differences of: strength, effort potential, endurance, speed of movement.- Knowledge of the metabolic processes behind musuclar activity and their responses to specific types of physical activity.- Knwoledge of the cardiovascular and respiratory responses during physical effort, as well as the limitations with regards to physical effort capacity. - Knowledge of the methabolic basisc of the oxygen supply and it’s relationship to physical performance. |

1. **Contents**

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| **8.1. Lecture** | **Teaching methods** | **Observations** |
| 1. Definition, content, concepts, principles, objectives, methodologies, significance, perspective, future development directions on adaptation to effort.

Interrelation body-physical effort. Physical effort: definition, significance, stress factor. Parameters of physical effort. Classification of physical efforts, adaptation types. 1. Typology of muscular activity. Muscular excitability. Influence of physical effort on muscular excitability. Muscular contractility. Types of contractions.
2. Energy sources for human physical activity: Alactacida anaerobic energy source (fosfagen system), Lactacid anaerobic energy source (Glycogen system - lactic Acid), Aerobic energy source. Power and ability metabolic processes of energy production
3. Changes of the blood panel during effort: morphological and biochemical modifications, immediate and delayed. Hydro mineral balance during effort and rest.
4. Respiratory changes during effort: factors limiting effort, stages of gas exchange, nervous and humoral respiration regulation; Effort effects on ventilation rate; apnea (moderately aerobic effort), hyperventilation (intensely aerobic-anaerobic effort);

Alveolocapillary diffusion during effort; ventilation coefficient; distribution of ventilation and pulmonary capillary diffusion; hemoglobin dissociation curve.1. Cardiovascular adaptation to effort. Relevant issues in cardiovascular adjustment; Heart rate, cardiac performance indexes.Cardiovascular adaptation to effort. Increase of oxygen transport. Arteriovenous difference increase. Arterial pressure. Cardiovascular functional reserves.
2. Endocrine system adjustment to effort; hypophyses’ hormones; medulla suprarenal hormones; thyroid hormones; parathyroid hormones; pancreatic hormones; sex glands’ hormones.
 | Video presentations, interactive discussions, presentationsVideo presentations, interactive discussions,  | 2 hours2 hours2 hours2 hours2 hours2hours2hours |
| **Bibliography****mandatory**1. Adams G, Beam W. Exercise Physiology Laboratory Manual, Mc Graw-Hill Humanities, 2010.
2. William D. McArdle, [Frank I. Katch](https://www.amazon.com/Frank-I.-Katch/e/B000APOYDE/ref%3Ddp_byline_cont_book_2), [Victor L. Katch](https://www.amazon.com/Victor-L.-Katch/e/B001IGUNSO/ref%3Ddp_byline_cont_book_3). Exercise Physiology: Energy, Nutrition, and Human Performance Fifth Editio, 2016 - ISBN-13: 978-0781725446; ISBN-10: 0781725445
3. [William D. McArdle](https://www.google.ro/search?hl=ro&tbo=p&tbm=bks&q=inauthor:%22William+D.+McArdle%22), [Frank I. Katch](https://www.google.ro/search?hl=ro&tbo=p&tbm=bks&q=inauthor:%22Frank+I.+Katch%22), [Victor L. Katch](https://www.google.ro/search?hl=ro&tbo=p&tbm=bks&q=inauthor:%22Victor+L.+Katch%22). Essentials of Exercise Physiology Lippincott Williams & Wilkins, 2006 - 753 pagini

**Selective**Ehrman JK, Gordon P, Visich PS, Keteyian SJ. Clinical Exercise Physiology, 2009.Sbenghe T., Kinesiologie. Știința mișcării, Ed. Medicală, București, 2008.Reilly T. Sport Exercise and Environmental Physiology Churchill Livingstone, 2005. |
| **8.2. Seminar / practical classes** | **Teaching methods** | **Observations** |
| Typology of effort. Physiological particularities of maximal effort. Evaluation. Physiological particularities of medium level effort. Evaluation. Evaluation of biometric qualities. Functional respiratory evaluation Cardiovascular functional evaluation Neuromuscular functional evaluation Neuromuscular fatigue. Evaluation Evaluation of the body’s after effort recovery capacity. | Video presentations, interactive discussions, presentations, practical exercises | 2 hours2 hours2 hours2 hours2 hours2 hours2 hours |
| **Bibliography****mandatory**1. Adams G, Beam W. Exercise Physiology Laboratory Manual, Mc Graw-Hill Humanities, 2010.
2. William D. McArdle, [Frank I. Katch](https://www.amazon.com/Frank-I.-Katch/e/B000APOYDE/ref%3Ddp_byline_cont_book_2), [Victor L. Katch](https://www.amazon.com/Victor-L.-Katch/e/B001IGUNSO/ref%3Ddp_byline_cont_book_3). Exercise Physiology: Energy, Nutrition, and Human Performance Fifth Editio, 2016 - ISBN-13: 978-0781725446; ISBN-10: 0781725445
3. [William D. McArdle](https://www.google.ro/search?hl=ro&tbo=p&tbm=bks&q=inauthor:%22William+D.+McArdle%22), [Frank I. Katch](https://www.google.ro/search?hl=ro&tbo=p&tbm=bks&q=inauthor:%22Frank+I.+Katch%22), [Victor L. Katch](https://www.google.ro/search?hl=ro&tbo=p&tbm=bks&q=inauthor:%22Victor+L.+Katch%22). Essentials of Exercise Physiology Lippincott Williams & Wilkins, 2006 - 753 pagini

**Selective**Ehrman JK, Gordon P, Visich PS, Keteyian SJ. Clinical Exercise Physiology, 2009.Sbenghe T., Kinesiologie. Știința mișcării, Ed. Medicală, București, 2008.Reilly T. Sport Exercise and Environmental Physiology Churchill Livingstone, 2005. |

1. **Correlation of the discipline contents with the expectations of the epistemic community, professional associations, and representative employers from the afferent program field**

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| Knowledge and abilities are established as didactic objectives and specified as such in the analytic programs that are revised yearly. After their analysis by the study discipline staff, these are discussed and approved in the Curricular Committee, towards curricular harmonization among the various study disciplines. Along this entire process systematic evaluation is performed, directly if possible, regarding the correspondence of the contents to the expectations of the academic community and of the representatives of the social community, professional associations, and employers. |

1. **Evaluation**

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| **Type of activity** | **Type of activity** | **Evaluation methods** | **Contribution to the final grade** |
| **Lecture** | Acquisition of the theoretical concepts and ideas presented during the lectures | Written exam | 50% |
| **Seminar/practical classes** | Knowledge of practical activity material | Colloquium practical activity | 40% |
| Lab activity and quality of term papers | Tests throughout the semester | 10% |
| **Minimal performance standard:** Knowledge of the physiological mechanism of muscular contraction and of the ways the heart adapts to effort. |

**Date:**

23.09.2019  **Signature of head of discipline**

Lecturer Daniela-Viorelia Matei, Ph-D

**Department approval date**

30.09.2019

 **Signature of department director**

Lecturer Daniela-Viorelia Matei, Ph-D