**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** | | | | | | | | |
| **2.1.** | **Subject: Physiology RE1105** | | | | | | | |
| **2.2.** | **Module leader:** Lecturer Ciochina Dan, PhD | | | | | | | |
| **2.3.** | **Seminar leader:** drd Buculei Ioana | | | | | | | |
| **2.4. Year of study** | | **1** | **2.5. Semester in which is taught** | **1** | **2.6. Evaluation type** | Written exam | **2.7. Subject status** | Mandatory  DF |

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

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| **3.1.Number of hours / week** | 4 | **3.2. Courses number of hours / week** | 2 | **3.3.Seminar / l practical classes** | 2 |
| **3.4. Total number of learning hours** | 56 | **3.5. Courses** | 28 | **3.6. Seminar / practical classes** | 28 |
| **3.7. Distribution of the available time** | | | | | Hours |
| **Study based on the manual, lecture support, bibliography and hand notes** | | | | | 21 |
| **Supplementary documentation in the library, using specialised platforms via internet and by field work** | | | | | 38 |
| **Preparation for seminars / practical classes, study themes, reviews, portofolio, and essays** | | | | | 10 |
| **Tutorship** | | | | | 4 |
| **Examinations** | | | | | 4 |
| **Other activities** | | | | |  |
| **3.8. Total hours of individual study** | | | | | 69 |
| **3.9. Total hours pes semester** | | | | | 125 |
| **3.10. Number of credits** | | | | | 5 |

1. **Preconditions (where applicable)**

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| **4.1.** of curriculum |  |
| **4.2.** of competences |  |

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) | C1.1 Description of concepts, theories and fundamental terms of the human body’s physiological and pathological mechanism; identification of symptoms, clinical signs and of the appropriate kinesytherapeutic methods and techniques.  C2.1 Defining general and local effects of medical massage, description of the main massage techniques for each body regions, taking into account the indication and counter-indications.  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. |
| Transverse competences (of role, of professional development, personal) |  |

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

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| **7.1.** General objective | - Understanding the functional algorithms and the regulations mechanisms of the human body systems and on a molecular, cellular and tissue level, considering the independence and the interdependence of the body’s systems. |
| **7.2.** Specific objectives | - the study of processes and normal constants of the superior organized biological structures, starting with the cells and cellular aggregates from the different tissue types and ending with the human body, the most evolve biological entity.  - acquisition of methods, means and models for studying and research, both theoretical and experimental.  - defining, measuring and interpreting functional parameters on different levels: molecule, tissue, system and entire body. |

1. **Contents**

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| **8.1. Lecture** | **Teaching methods** | **Observations** |
| 1. Elements of cellular and molecular physiology. Electrical membrane phenomena. Ionic channels.  2. Membrane action and resting potential. Primary and secondary messengers.  3. Movement, posture and locomotor function development. Morpho-physiological elements of bone and joint. Skeletal system functions. Articular statics and dynamics  4. The properties of the muscle fiber. Permeability and electrical polarity. Excitability. Contractility. Elasticity. Tonicity.  5. Specifics of muscle contraction in the body. Types of muscle contraction. Muscle strength. Muscle fatigue.  6. Muscle metabolism. Oxygen consumption and energy substrate.  7. Trophicity muscle. Motor activity, motor abilities, dynamic stereotype.  8. Physiology of the peripheric nervous system. The reflex action and the physiology of the reflexes. Myotatic reflexes.  9. Physiology of the central nervous system. Sleep and wake, praxic cortical activity.  10. Properties of the myocardium. Electrical activity at the heart level.  11. Mechanical activity of the heart. Cardiac debit and its physiological variations.Regulation of heart activity  12. Elements of vascular physiology  13. Pulmonary ventilation. Haematosis.  14.Transport of respiratory gases. Tissue and cellular breathing. Respiratory regulation. Phonation. | Video presentations, interactive discussions  Video presentations, interactive discussions | 2 hours  2 hours  2 hours  2 hours  2 hours  2 hours  2 hours  2 hours  2 hours  2 hours  2 hours  2 hours  2 hours  2 hours |
|  | | |
| **8.2. Seminar / practical classes** | **Teaching methods** | **Observations** |
| 1.Elements of molecular and cellular physiology; neuromuscular synapses.  2. Stages of the excitation-contraction mechanism; typology of muscular activity.  3. Striated muscle properties: elasticity, firmness, contractility, excitability.  4. The work muscle. muscle fatigue. Dynamometry.  5. Evaluation of muscular labor. Ergometry.  6.Neuro-muscular physiology component.  7. Physiology of the peripheric nervous system. The reflex action and the physiology of the reflexes. Myotatic reflexes.  8. Physiology of the central nervous system. Sleep and wake activity.  9.Superior nervous activity; psychological and psychometric evaluation  10. Electrical activity at heart level. Electrocardiography. Analysis of the EKG.  11. Phonic activity of the heart. Analysis and interpretation of the phonocardiogram.  12. Measuring blood pressure directly and indirectly  13. Mechanics of human ventilation: volumes and pulmonary capacities.  14. Ventilatory debits, flux-volume pressure-volume curves | Practical demonstration,  Interactive discussions | 2 hours  2 hours  2 hours  2 hours  2 hours  2 hours  2 hours  2 hours  2 hours  2hours  2 hours  2 hours  2 hours  2 hours |
| **Bibliography**  **mandatory**  1. Haulica I., Fiziologie umana (ed. III-a) Ed. Medicala 2009.  2. Guyton A. G., Tratat de fiziologie a omului, Ed. Medicală Callisto, București, 2007.  3. Slatineanu Simona, Ghid de lucrari practice de fiziologie, Lito UMF Iasi 1998.  **selective**  1. Klime J., Biological Foundations of Biomedical Engineering, Little, Brown and Co., 2000.  2. Schmidt R. F., Physiologie, De Boeck Universite, Paris, Bruxelles, 2001.  3. Stratone A, Ciochina A., Fiziologie și explorare cardiovasculară, Ed. BIT 1998.  4. Stratone Ana, Topoliceanu Fl., Filip FL., Function Testing Handbook – A Practical Guide for Foreign Students, Ed. BIT 1998.  5. Sbenghe T., Kinesiologie. Știința mișcării, Ed. Medicală, București, 2008.  6. Slatineanu Simona, Ghid de lucrari practice de fiziologie, Lito UMF Iasi 1998. | | |

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**: Knowing the basic notions of physiological mechanisms of the human body | | | |

**Date Signature of head of discipline**

Lecturer Ciochina Dan, PhD

25.09.2019

**Department approval date**

30.09.2019

**Signature of department director**

Lecturer Daniela-Viorelia Matei, Ph-D