**ACADEMIC DISCIPLINE OVERVIEW**

1. **Program data**

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| 1.1. Higher education institution | Grigore T. Popa University of Medicine and Pharmacy Iasi |
| 1.2. Faculty | Medical Bioengineering |
| 1.3. Department | Biomedical Sciences |
| 1.4. Field of study | Health |
| 1.5. The cycle of studies | Bachelor |
| 1.6. Study program / qualification | Balneo-physiokinetotherapy and rehabilitation – english language / Physiokinetotherapist |

**2. Discipline data**

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| 2.1. Name of the discipline / Code | **Biochemistry** | **RE1103** |
| 2.2. Teaching staff in charge with lectures |  **Lecturer Mădălina Poștaru Roxana, PhD** |
| 2.3. Teaching staff in charge with practical activities |  **Lecturer Mădălina Poștaru Roxana, PhD** |
| 2.4. Year of study | **I** | 2.5. Semester | **1** | 2.6. The type of assessment | **Exam, E1** |
| 2.7. Discipline type | **Mandatory** | **Fundamental discipline** |

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

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| 3.1. Number of hours / week: | 3.2. Courses number of hours / week | 3.3. Seminars / practical classes number of hours / week |
| Semester 1 | **2** | **1** | **1** |
| Semester 2 |  |  |  |
| 3.4. Total number of learning hours: | **28** | 3.5. Of which: Courses | **14** | 3.6. Of which: Seminars / practical classes: | **14** |
| 3.7. Distribution of individual study time: | Hours sem. 1 | Hours sem. 2 |
| Study time using course book materials, bibliography and hand notes | 10 |  |
| Supplementary documentation in the library, using specialised platforms via internet and by field work | 6 |  |
| Preparation time for seminars / practical classes, study themes, reviews, portfolio and essays | 6 |  |
| Tutorship | 2 |  |
| Examinations | 2 |  |
| Other activities |  |  |
| Total hours of individual study (*without examinations*) | **22** |  |
| 3.8. Total hours per semester | **50** |  |
| 3.9. Number of credits | **2** |  |

**4. Preconditions (where applicable)**

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| 4.1. of curriculum | Not necessary |
| 4.2. of competences | Not necessary |

5. **Conditions (where applicable)**

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| 5.1. for lectures | Not necessary |
| 5.2. for seminars / practical classes | The glassware needed in the chemistry lab. Materials, reagents and solvents. Equipment and specific instruments.Students will wear protective clothing (lab coat, disposable gloves) |

**6. Specific competences acquired**

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| **Professional competencies** | **C1.1** | Description of the concepts, theories and fundamental concepts of physiological and pathological mechanisms of the human body, recognition of the symptoms and clinical signs, identification methods and techniques of physiotherapy. |
| **C.1.2** | The formulation of the hypotheses and operationalization of the key concepts to explain syndromes and / or diseases.  |

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| **Transversal****competencies** | **CT3** | The identification of the objectives to be achieved, the resources available, the conditions for completion of their work flow, working time, deadlines and related risks.Effective use of information sources and resources for communication and assisted professional training (Internet portals, specialized software applications, databases, online courses, etc.)  |

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

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| 7.1. General objective | The course aims is to broaden the knowledge regarding the biological parameters in general and their mechanisms of action.Explaining the used processes underlying of the clinical laboratory methods;Using proper terminology and a consistent expression;Solving practical problems. |
| 7.2. Specific objectives | Learning the basic principles of methods and analytical techniques used in the clinical laboratory for the determination of organic and inorganic components of the biological samples;Acquiring knowledge for the preparation of the biological material and fair processing of results;Formation of the practical work skills. |

**8. Contents**

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| **8.1. Lectures** | **Teaching methods** | **Observations** |
| 1 | Introduction to the biochemistry study. Amino acids: structures, biological functions, biomedical importance. | Oral presentationPowerPointpresentation | 2 |
| 2 | Peptides and proteins: structures, biological functions, biomedical importance. | Oral presentationPowerPointpresentation | 2 |
| 3 | The conformation and dynamics of the biochemical structures exemplified by the relationship between three-dimensional structure of the proteins and their biological function. Enzymes and their function | Oral presentationPowerPointpresentation | 2 |
| 4 | Carbohydrate metabolism - a constant supply of energy to living cells | Oral presentationPowerPointpresentation | 2 |
| 5 | Lipid metabolism | Oral presentationPowerPointpresentation | 2 |
| 6 | Vitamins | Oral presentationPowerPointpresentation | 2 |
| 7 | Biochemical basis of muscle activity | Oral presentationPowerPointpresentation | 2 |

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| **8.2. Practical activities - practical class**  | **Teaching methods** | **Observations** |
| 1 | Biochemical properties of amino acids: ionization of amino acids in 0 - 14 pH range | Oral presentationPerforming the lab work, obtaining the experimental data results | 2 |
| 2 | Methods of dosing the concentration of biochemical parameters. The biochemical analyzer | Oral presentationPerforming the lab work, obtaining the experimental data results | 2 |
| 3 | Determination of serum transaminases using the biochemical analyzer | Oral presentationPerforming the lab work, obtaining the experimental data results | 2 |
| 4 | Determination of serum glucose using the biochemical analyzer | Oral presentationPerforming the lab work, obtaining the experimental data results | 2 |
| 5 | Determination of total serum cholesterol and LDL-cholesterol using the biochemical analyzer | Oral presentationPerforming the lab work, obtaining the experimental data results | 2 |
| 6 | Determination of total and conjugated bilirubin by colorimetric method using the biochemical analyzer | Oral presentationPerforming the lab work, obtaining the experimental data results | 2 |
| 7 | Urine summary examination/the urinary sediment. Detection of biochemical parameters present in urine | Oral presentationPerforming the lab work, obtaining the experimental data results | 2 |

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| **8.3. Bibliography:** |
| ***Mandatory:*** |
| * Discipline lectures;
 |
| * Louda W. Deborah, Biochemistry Review – Overview of Biomolecules, Florida Atlantic University, 2012, available free online;
* Ferrier R. Denise, Biochemistry - Lippincott’s Illustrated Reviews, 6th Edition, 2014, available free online;
* Oxford Handbook of Clinical and Laboratory Investigation, Oxford University Presss, 2018, available free online.
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| ***Elective:*** |
| * Pamela C. Champe, Biochemistry, 2nd Edition, J. B. Lippincott Company
* Jacques-Henry Weil, Biochimie générale, 11e edition (French edition)
* Elena Petrescu-Dănilă, Raluca Ștefania Stănescu, Gabriela Bordeianu, Biochemistry – laboratory guide for medical students, UMF Iasi, 2016
* Biochemistry Laboratory, Cornelia Mircea, UMF Iasi, 2015
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**9. *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. |

**10. Evaluation**

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| Type of activity | Assessment criteria | Evaluation methods | Contribution to the final grade |
| Lectures | Acquiring theoretical notions and presented in the course | Written exam. MCQ Examination | 80 % |
| Practical activities | Activities carried out in laboratory and conducted quality essays. | Colloquium practical activity | Admitted/ Rejected |
| Individual study | Preparation time for seminars / practical classes, study themes, reviews, portfolio and essays.Individual study using coursebook materials, bibliography and hand notes, documentation in the library, using specialised platforms via internet and by field work. | Tests during the semester | 20 % |
| Minimal performance standard:* Minimal knowlegde of amino acids and proteins, carbohydrate and lipid metabolims, and muscle biochemistry
* Knowlegde of amino acids ionization
* Knowledge of blood glucose determination
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| Date | Holder of course / signature, | Holder of practical activities / signature, |
| 10.09.2024 |  |  |

 Lecturer Mădălina Poștaru, PhDLecturer Mădălina Poștaru, PhD

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| Date of approval in the Department Council/Teaching Council,  |
| 19.09.2024 |  | Department director / signature,Associate Professor Daniela-Viorelia Matei, MD, PhD |
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