**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 | | | | **Clinical laboratory tests** | | **RE1228** |
| 2.2. Teaching staff in charge with lectures | | | | **Lecturer Corina Cheptea, PhD** | | |
| 2.3. Teaching staff in charge with practical activities | | | | **Lecturer Corina Cheptea, PhD** | | |
| 2.4. Year of study | **II** | 2.5. Semester | **1** | 2.6. The type of assessment | **Colloquium, C1** | |
| 2.7. Discipline type | | **Facultative** | | **Facultative 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 | | | | | 5 |  | |
| Supplementary documentation in the library, using specialised platforms via internet and by field work | | | | | 5 |  | |
| Preparation time for seminars / practical classes, study themes, reviews, portfolio and essays | | | | | 6 |  | |
| Tutorship | | | | | 2 |  | |
| Examinations | | | | | 2 |  | |
| Other activities | | | | | 6 |  | |
| 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 | It's not necessary |
| 4.2. of competences | It's not necessary |

5. **Conditions (where applicable)**

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| 5.1. for lectures | It's not necessary |
| 5.2. for seminars / practical classes | specific glassware for the chemistry laboratory; substances, reagents and solvents; Specific equipment and apparatus.  The students will have protective equipment |

**6. Specific competences acquired**

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| **Professional competencies** | **C1.1** | The interdisciplinary approach for some topics in the field of chemistry;  Knowledge of the theoretical and practical principles of chemical and biochemical analysis techniques of proteins, enzymes and biocatalysts.  The students ability to identify and explain the operation of a catalytic process in the living cell. |
| **C 1.2** | Carrying out the experiments, rigorous application of the analysis methods and interpretation of the results, in compliance with occupational health and safety regulations. |

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| **Transversal**  **competencies** | **CT3** | - The students' ability to work in groups, to consult specialized literature and to organize the experiment to obtain the necessary data; correlating the acquired knowledge ensuring the interdisciplinarity necessary for a modern and quality education;  - fulfilling own duties with responsibility |

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 enlarge the parte of knowledge regarding biological parameters and their mechanisms of action in general.  Explaining the processes underlying the methods used in the clinical laboratory;  Using appropriate terminology and coherent expression;  The ability to solve practical problems. |
| 7.2. Specific objectives | Acquiring the basic principles of some analytical methods and techniques, used in the clinical laboratory for the dosage of organic and inorganic components, from biological samples;  Acquiring the necessary knowledge for the preparation of the biological material and the correct processing of the obtained results;  The formation of practical skills and abilities to work in the biochemical analysis laboratory. |

**8. Contents**

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| **8.1. Lectures** | | **Teaching methods** | **Observations** |
| 1 | Introduction to clinical chemistry: definition, analytes, biological specimens, steps of analysis, sample obtaining, storage and preparation for analysis; | Interactive lecture, Discussions, Explanations, Problematization | 2 |
| 2 | Optical methods (UV-VIS spectrophotometry; atomic absorption, dry layer technology, turbidimetry, refractometry, polarimetry, optical fiber sensors) applied in the analysis of biological samples; | Interactive lecture, Discussions, Explanations, Problematization | 2 |
| 3 | Clinical trial selection strategies. Sources of errors in the clinical laboratory; | Interactive lecture, Discussions, Explanations, Problematization | 2 |
| 4 | Determination of some organic compounds: carbohydrates. | Interactive lecture, Discussions, Explanations, Problematization | 2 |
| 5 | Determination of some organic compounds: lipids, non-protein nitrogenous compounds | Interactive lecture, Discussions, Explanations, Problematization | 2 |
| 6 | Determination of inorganic compounds: enzymes, hormones, tumor markers; | Interactive lecture, Discussions, Explanations, Problematization | 2 |
| 7 | Special fields of clinical chemistry: drug treatment monitoring, toxicology | Interactive lecture, Discussions, Explanations, Problematization | 2 |

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| **8.2. Practical activities - practical class** | | **Teaching methods** | **Observations** |
| 1 | Methods of measuring blood glucose - role in the diagnosis and monitoring of diabetes | working in the laboratory, obtaining experimental data resulting from glucose dosing. Processing of experimental data and presentation of conclusions | 2 |
| 2 | Cholesterol dosage - cardiovascular risk factor | working in the laboratory, obtaining experimental data resulting from cholesterol dosage. Processing of experimental data and presentation of conclusions | 2 |
| 3 | Fe dosage – role in the evaluation of anemias | Processing of experimental data and presentation of conclusions | 2 |
| 4 | Bilirubin dosage | Processing of experimental data and presentation of conclusions | 2 |
| 5 | Urine. Urine analysis - Urine strips | Processing of experimental data and presentation of conclusions | 2 |
| 6 | Chemical and biochemical interpretation of analysis results.  Presentation of the paper | Explanations. Problematization.  Discussions on the presented paper | 4 |

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| **8.3. Bibliography:** |
| ***Mandatory:*** |
| 1. David E. Metzler, Biochemistry. The chemical reactions of living cells, ElsevierAcademic Press, vol.1, vol.2, 2021  2. L. Kaplan, A. Pesce, Clinical chemistry: theory, analyssis corelations, Ed. St. Louis, Mosley, 2010  3. Corina Cheptea, Bazele Biochimiei, Ed. Tehnopress, 2019  4. Corina Cheptea, Marin Zagnat, Mădălina Poștaru, Cristian Cătălin Gavăt, Biochimie experimentală, Ed. Pim, 2019 |
| ***Elective:*** |
| M. Bishop, J. L. D. Dubin – Engelkirk, E. P. Fody, Clinical Chemistry. Principle, procedure, correlation, Ed. Lippincott Williams & Wilkins, 1999 |
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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.  Study time 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:   * minimum grade is 5 * Blood glucose measurement methods; chemical and biochemical interpretation of analysis results | | | |

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| Date | Holder of course / signature, | Holder of practical activities / signature, |
| 12.09.2024 |  |  |

Lecturer Corina Cheptea, PhD Lecturer Corina Cheptea, 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 |