**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 | | | | **Medical Informatics. Biostatistics** | | **RE1117** |
| 2.2. Teaching staff in charge with lectures | | | | **Professor Dragoș Arotăriței, PhD** | | |
| 2.3. Teaching staff in charge with practical activities | | | | **Assistant Professor Andrei Gheorghiță, PhD** | | |
| 2.4. Year of study | **I** | 2.5. Semester | **2** | 2.6. The type of assessment | **Colloquium, C2** | |
| 2.7. Discipline type | | **Mandatory** | | **Complementary 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 |  |  | |  | | | |
| Semester 2 | **3** | **1** | | **2** | | | |
| 3.4. Total number of learning hours: | **42** | 3.5. Of which: Courses | **14** | 3.6. Of which: Seminars / practical classes: | | | **28** |
| 3.7. Distribution of individual study time: | | | | | Hours sem. 1 | Hours sem. 2 | |
| Study time using course book materials, bibliography and hand notes | | | | |  | 4 | |
| Supplementary documentation in the library, using specialised platforms via internet and by field work | | | | |  | 2 | |
| Preparation time for seminars / practical classes, study themes, reviews, portfolio and essays | | | | |  | 2 | |
| Tutorship | | | | |  | 2 | |
| Examinations | | | | |  | 2 | |
| Other activities | | | | |  |  | |
| Total hours of individual study (*without examinations*) | | | | |  | **8** | |
| 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 | - |
| 4.2. of competences | - |

5. **Conditions (where applicable)**

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| 5.1. for lectures | Video logistic support |
| 5.2. for seminars / practical classes | Hardware (PC) and software (Microsoft Office, Word and EXCEL) support/LibreOffice EXCEL |

**6. Specific competences acquired**

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| **Transversal**  **competencies** | **CT3** | Effective use of information sources and resources for communication and assisted professional training (Internet portals, specialized software applications, databases, online courses, etc.)  Identification of objectives to be achieved, available resources, conditions for tasks completion, milestones and working times, as well as deadlines and risks. |

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

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| 7.1. General objective | The knowledge and proper use of subject-specific concepts, the acquisition of knowledge on the design, implementation, use and handling of information from medical and kinesiology records. |
| 7.2. Specific objectives | The understanding of the ideas underlying the data collection, following the principles of organizing and analyzing information.  The learning of the concepts relating to medical information systems.  The knowledge of discovery of relationship among data records using specific tools. |

**8. Contents**

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| **8.1. Lectures** | | **Teaching methods** | **Observations** |
| 1 | Information in data and hyperdata, structured and unstructured data. The notion of information. Organisation and displaying data. Medical Informatics. | Interactive lectures,  Discussions, Explanations | 2h |
| 2 | Measurements and Statistics. Applied Informatics in physio-kinesiotherapy and rehabilitation. Current problems and tendency. Population. The sample. Data Types. Frequency distribution. Class interval. Frequencies diagram. | Interactive lectures,  Discussions, Explanations | 2h |
| 3 | Percentiles. Measures of central tendency: the mode, the median and the mean. | Interactive lectures,  Discussions, Explanations | 2h |
| 4 | Measures of Variability. Standard Deviation and variance. The normal curve and sampling error. Z scores. Levels of confidence and probability of error. Calculating skewness and kurtosis. | Interactive lectures,  Discussions, Explanations | 2h |
| 5 | Regression models. Correlation, Prevalence. | Interactive lectures,  Discussions, Explanations | 2h |
| 6 | Simple Analysis of Variance (ANOVA). | Interactive lectures,  Discussions, Explanations | 2h |
| 7 | Analysis of nonparametric Data. Chi-Square. | Interactive lectures,  Discussions, Explanations | 2h |

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| **8.2. Practical activities - practical class** | | **Teaching methods** | **Observations** |
| 1 | Worksheets in EXCEL. Excel and file types: xls, xlsx, csv, txt. Data and formats. Identification of cells. Graphics in Excel (LibreOffice) | Practical applications, discussion, explanations. | 2h |
| 2 | EXCEL, built in functions. Mathematical Libraries. Sorting filters. Display data in Excel. Frequency distribution and cumulative frequency. Examples in kinesiology. | Practical applications, discussion, explanations. | 2h |
| 3 | Calculation using percentiles. Measures of central tendency. Mode, Median, and Mean. | Practical applications, discussion, explanations. | 2h |
| 4 | Measures of variability. Standard Deviation and Variance. | Practical applications, discussion, explanations. | 2h |
| 5 | The normal curve. z Scores. Level of confidence. Skewness and kurtosis. | Practical applications, discussion, explanations. | 2h |
| 6 | Fundamentals of statistical Inference. Correlation. Linear Regression. Multiple correlation and multiple regression. T-test. | Practical applications, discussion, explanations. | 2h |
| 7 | The analysis of variance (ANOVA). F distribution, tables. | Practical applications, discussion, explanations. | 2h |

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| ***Mandatory:*** |
| *1.* Course materials and practical works posted on the e-learning platform of UMF "Grigore T Popa" Iasi  *2. Joseph P. Weir , William J. Vincent, Statistics in Kinesiology, Human Kinetics Publishers, 2012.*  *3.* Margunn Aanestad, Miria Grisot, Ole Hanseth, Polyxeni Vassilakopoulou, Information Infrastructures within European Health Care, Springer, 2017 |
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| ***Elective:*** |
| *1.* *Moh Malek, Jared Coburn, William Marelich, Advanced Statistics for Kinesiology and Exercise Science A Practical Guide to ANOVA and Regression Analyses, Routledge, 2018.*  *2. Edward H. Shortliffe, James J.Cimino, Biomedical Informatics, Springer, 2014*  *3.Brian S. Everitt, Modern Medical Statistics, Oxford University Press Inc., New York, 2003.* |

**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:   * Knowledge of descriptive statistical indicators. * Implementation in EXCEL a statistical analysis for a given dataset (mean, mode, median, standard deviation, variance). * Implementation in EXCEL a simple linear regression model for a given set of data. | | | |

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| Date | Holder of course / signature, | Holder of practical activities / signature, |
| 11.09.2024 | Professor Dragoș Arotăriței, PhD | Assistant Professor Andrei Gheorghiță, PhD |

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| Date of approval in the Department Council/Teaching Council, | | |
|  |  | Department director / signature, |
| 19.09. 2024 |  | Associate Professor Daniela-Viorelia Matei, MD, PhD |