**SYLLABUS**

1. **Programme Details**

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| **1.1.** | **GRIGORE T. POPA UNIVERSITY OF MEDICINE AND PHARMACY IASI** |
| **1.2.**  | **FACULTY : MEDICINE / DEPARTMENT:** PREVENTIVE MEDICINE AND INTERDISCIPLINARITY |
| **1.3.** | **DISCIPLINE:** MEDICAL INFORMATICS AND BIOSTATISTICS |
| **1.4.**  | **FIELD of STUDY:** **HEALTH** |
| **1.5.** | **STUDY CYCLE: BACHELOR**  |
| **1.6.** | **PROGRAMME of STUDY: Medicine - English**  |
| 1. **Discipline Details**
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| **2.1.** | **Name of the Discipline:** MEDICAL INFORMATICS AND BIOSTATISTICS |
| **2.2.** | **Teaching staff in charge with lectures:** Assoc. Prof. PhD. Vasile Lucian Boiculese |
| **2.3.** | **Teaching staff in charge with seminar activities:** Assoc. Prof. PhD. Vasile Lucian Boiculese |
| **2.4. Year**  | **I** | **2.5. Semester** | **I / II** | **2.6. Type of evaluation**  | C1/C2 | **2.7. Discipline regimen**  | Compulsory |

1. **Overall Time Estimates (hours/semester of didactic activity)**

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| * 1. **Number of hours per week**
 | 4 | **Of which: 3.2. lectures** | 2 | * 1. **seminar/ laboratory**
 | 2 |
| * 1. **Total hours in the curriculum**
 | 52 | **Of which: 3.5. lectures** | 24 | **3.6. seminar/ laboratory** | 28 |
| **Distribution of time**  |  |  |  |  | Hours |
| **Study time using coursebook materials, bibliography and notes**  | 10 |
| **Further study time in the libray, online and in the field** | 2 |
| **Preparation time for seminars / laboratories, homework, reports, portfolios and essays** | 7 |
| **Tutoring** | 2 |
| **Examinations** | 2 |
| **Other activities** |  |
| **3.7. Total hours of individual study** |  | 23 |
| **3.8. Total hours / semester** |  | 75 |
| **3.9. Number of credits**  |  | 3 |

1. **Prerequisites (where applicable)**

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| **4.1. curriculum** | Not applicable |
| **4.2. competences** | Basic knowledge of mathematics and computer usage - obtained during high school. |

1. **Conditions (where applicable)**

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| **5.1. for lecture delivery** | Not applicable |
| **5.2. for seminar / laboratory delivery** | Not applicable |

1. **Specific Competences Acquired**

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| **Professional Competences (knowledge and skills)** | Spreadsheet computations (MS Excel) for medical data management.Competence in the calculation and interpretation of descriptive statistical parameters and confidence intervals.Basic statistical analysis (hypothesis tests: t-student, Fisher).Methods for calculating and interpreting linear regression and correlation. Charting in Microsoft Excel. |
| **Transversal Competences (roles, personal and professional development)** | Acquired knowledge will be used in understanding and interpretation of concepts used in continuous medical training and research (interpretation, conception). |

1. **Obiectives of the Discipline (related to the acquired competences)**

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| **7.1. General Obiective** | Acquiring knowledge of descriptive statistics and basic statistical analysis. |
| **7.2. Specific Obiectives**  | Use MS Excel for medical data management, basic descriptive calculus and statistical analysis. |

1. **Contents**

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| **8.1. Lecture** | **Teaching methods**  | **Comments** |
| Lecture 1. History. Information, medical informatics, computer system, hardware, software. Windows operating system - general elements of computer usage. | MS PowerPoint presentation and Excel examples. | Interactive |
| Lecture 2. Microsoft Excel spreadsheet computation - data types, operators, cell formatting, *autofill* technique, custom lists and formulas. | MS PowerPoint presentation and Excel examples. | Interactive |
| Lecture 3. Microsoft Excel - absolute reference, the R1C1 reference style, functions for calculation of statistical measurement, counting - simple and conditional, the if() function, random number generator. | MS PowerPoint presentation and Excel examples. | Interactive |
| Lecture 4. Microsoft Excel - pivot tables, filters, the total technique, conditional formatting. | MS PowerPoint presentation and Excel examples. | Interactive |
| Lecture 5. Microsoft Excel - Strings functions. Charts. | MS PowerPoint presentation and Excel examples. | Interactive |
| Lecture 6. Types of distributions - elements of probability theory, Binomial distribution, Poisson distribution. | MS PowerPoint presentation and Excel examples. | Interactive |
| Lecture 7. Descriptive statistics, types of variables, statistical measurements. | MS PowerPoint presentation and Excel examples. | Interactive |
| Lecture 8. Frequencies distribution, the histogram, Gauss-Laplace distribution. | MS PowerPoint presentation and Excel examples. | Interactive |
| Lecture 9. Confidence intervals. | MS PowerPoint presentation and Excel examples. | Interactive |
| Lecture 10. Comparing populations through samples average - student or t test. Formula description, interpretation, examples. | MS PowerPoint presentation and Excel examples. | Interactive |
| Lecture 11. Comparing variances - Fisher's exact test, calculation, interpretation. | MS PowerPoint presentation and Excel examples. | Interactive |
| Lecture 12. Linear regression and correlation. Coefficients formula, interpretation, examples. | MS PowerPoint presentation and Excel examples. | Interactive |
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| **Bibliography**1. Cristina G. Dacsalu, Lucian V. Boiculese “Methods for Data Processing in Medical Practice – Guidelines in Access and Excel”, “Gr.T.Popa” Publisher, U.M.F. Iasi 2015.
2. Wayne W. Daniel, „Biostatistics – Basic Concepts and Methodology for the Health Sciences”, John Wiley&Sons 2010.
3. J.H. van Bemmel, M.A. Musen (editors) – Handbook of Medical Informatics, Springer 2000.
4. Nicholas P. Jewell, Statistics for Epidemiology, Chapman & Hall/CRC, 2004
5. Martin Bland “An Introduction to Medical Statistics” Oxford University Press – 1995
6. Lucian. V. Boiculese, Cristina Dascalu, Gabriel Dimitriu, Mihaela Moscalu, Adrian Doloca „Metode descriptive si elemente de analiza statistica a datelor medicale” – editura Performantica, Iasi 2012.
7. Lucian. V. Boiculese, G. Dimitriu, Mihaela Moscalu “Elemente de Biostatistică” – editura PIM, Iaşi, 2007.
8. Lucian V. Boiculese, Cristina Dascalu “Informatica medicala” –Editura Venus 2001
9. Doina Azoicăi, L.V. Boiculese, G. Pisică-Donose “Noţiuni de metodologie Epidemiologică şi Statistică Medicală” – Edit DAN, 2001.
10. \*\*\* Biostatistics
11. \*\*\* Microsoft Excel
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| **8.2. Seminar / Laboratory** | **Teaching methods**  | **Comments** |
| 1. Windows introduction : managing files, directories, installation and configuration. | Excel examples. | Interactive |
| 2. Microsoft Excel: data types, operators, reference methods, formatting, creating a function. | Excel examples. | Interactive |
| 3. Microsoft Excel: making calculations using library functions.  | Excel examples. | Interactive |
| 4. Microsoft Excel: data validation, , filters , sorting. | Excel examples. | Interactive |
| 5. Microsoft Excel: table summary with subtotals and pivot tables. | Excel examples. | Interactive |
| 6. Microsoft Excel: charting. | Excel examples. | Interactive |
| 7. Biostatistics: frequency distribution, class interval, relative frequency, absolute frequency, diagram frequencies, cumulative frequency. | Excel examples. | Interactive |
| 8. Biostatistics: probabilities, random number generation, descriptive statistic. | Excel examples. | Interactive |
| 9. Biostatistics: Gauss-Laplace distribution. | Excel examples. | Interactive |
| 10. Biostatistics: confidence intervals. | Excel examples. | Interactive |
| 11. Biostatistics: t-Student test (comparing the means) – hypothesis testing. | Excel examples. | Interactive |
| 12. Biostatistics: Fisher test (comparing the variances) – hypothesis testing. | Excel examples. | Interactive |
| 13. Biostatistics: Linear regression, Correlation. | Excel examples. | Interactive |
| 14. Final examples, discussions, practical problems, conclusions, examination training. | Excel examples. | Interactive |
| **Bibliography** |

1. **Correlations between the contents of the discipline and the expectations of the epistemic community, of profesional associations and of employers in the field**

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| Knowledge and skills are set as teaching objectives and specified as such in analytical programs reviewed annually. After analysis within the discipline, these are discussed and approved within the Curriculum Bureau, in the sense of harmonization with other disciplines. Throughout this process, the correspondence between content and the expectations of the academic community, community representatives, professional associations and employers is systematically assessed, as far as possible. As a primary goal, the discipline aims to provide students with the optimal prerequisites for the next years of study in the Bachelor of Medicine program, in order to successfully hire, immediately after graduation, in residency programs in Romania and other EU countries. |

1. **Evaluation**

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| **Type of activity**  | **10.1. Evaluation criteria:**  | **10.2. Methods of evaluation** | **10.3. Percentage of final grade** |
| **10.4. Lecture** | Grade for multiple choice test | standardized multiple choice test | 50% |
| **10.5. Seminar / Laboratory** | Average grade of ongoing examinations | ongoing evaluation | 10% |
| Grade for practical examination | practical exam | 40% |
| **Minimum standard of performance: at least grade 5 to pass the discipline** |

**Date: oct. 2019 Signiture of Didactic Co-ordinator**

**Prof .PhD. Gabriel Dimitriu**

 **Signiture of Department Director Assoc. Prof. PhD. Florin Petrariu**