**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**
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| **2.1.** | **Subject: Human genetics**  |
| **2.2.** | **Module leader: Associate Professor Ph.D. Maria Butnaru**  |
| **2.3.** | **Seminar leader: Associate Professor Ph.D. Maria Butnaru** |
| **2.4. Year of study** | **I** | **2.5. Semester in which is taught** | **I** | **2.6. Evaluation type** | C1 | **2.7. Subject status** |  ElectiveDF |

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

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| **3.1.Number of hours / week** | 2 | **3.2. Courses number of hours / week** | 1 | **3.3.Seminar / l practical classes** | 1 |
| **3.4. Total number of learning hours** | 28 | **3.5. Courses** | 14 | **3.6. Seminar / practical classes** | 14 |
| **3.7. Distribution of the available time** | Hours |
| **Study based on the manual, lecture support, bibliography and hand notes** | 10 |
| **Supplementary documentation in the library, using specialised platforms via internet and by field work** | 5 |
| **Preparation for seminars / practical classes, study themes, reviews, portofolio, and essays** | 7 |
| **Tutorship** | 2 |
| **Examinations** | 1 |
| **Other activities** |  |
| **3.8. Total hours of individual study** | 22 |
| **3.9. Total hours per semester** | 50 |
| **3.10. Number of credits** | 2 |

1. **Preconditions (where applicable)**

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

1. **Conditions (where applicable)**

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| **5.1.** for lectures | PowerPoint presentation facilities  |
| **5.2.** for seminars / practical classes | Optical microscopes. Glassware, materials, reagents, equipment and specific instruments, used in the cell and molecular biology laboratoryStudents will wear protective clothing (lab coat, disposable gloves).  |

1. **Specific competences acquired**

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| Professional competences (expressed as knowledge and abilities) | C.1.1 The ability to describe the concepts and theories about the fundamental mechanisms of functioning of the human body through its gens. C.1.2. The ability to formulate the assumptions and to use the key concepts to explain diseases |
| Transverse competences (of role, of professional development, personal) | CT.1 Ability to Identify objectives to be achieved, the resources available, the conditions to completion to their work flow, working time, deadlines and related risksCT.2. The ability to form work teams to solve complex practical activities and development of interdisciplinary scientific studies.CT.3. Effective use of the information sources and the communication resources (Internet portals, specialized data bases, online courses, etc.) both in Romanian and in a foreign language |

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

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| **7.1.** General objective | Knowledge the basic laws of the heredity and importance of the genetic integrity of the cells.  |
| **7.2.** Specific objectives | - Knowledge of the structure and functions of the nucleic acids in prokaryotic and eukaryotic cells;- Knowledge of the molecular mechanisms underlying heredity;- Learning techniques for study genetic matter of the cells - Training the skills transposing theoretical concepts in practical activity;- Training the skills to exploit the knowledge in an interdisciplinary context  |

1. **Contents**

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| **8.1. Lecture** | **Teaching methods** | **Observations** |
| Introduction. Chromosomal theory of the heredity. Mendelian genetics.  | Interactive course presentation, using PowerPoint slides | 2 hour |
| The structure and replication of the nucleic acids. Gen structure. Genotype. Recombination and Genetic Maps | Interactive course presentation, using PowerPoint slides | 2 hours |
| Gene transcription molecular mechanism and gene regulation Gene expression. Proteomic  | Interactive course presentation, using PowerPoint slides | 2 hours |
| Human chromosomes and karyotype. Chromosomal sex determination. | Interactive course presentation, using PowerPoint slides | 2 hours  |
| Cell division by mitosis and meiosis. The chromosomal anomalies (numerical and structural). Genetic mutations. Methods for screening of the genetic mutations. | Interactive course presentation, using PowerPoint slides | 2 hours |
| Prokaryote Genetics. Genetic engineering. Vectors for genes. | Interactive course presentation, using PowerPoint slides | 2 hours |
| Transgenic organisms and biotechnologies. Genetics of cancer | Interactive course presentation, using PowerPoint slides | 2 hours |
| **Bibliography**1. Bruce Alberts: **Molecular Biology of the Cell**. 6th edition, 2014
2. William Klug, Michael Cummings, Charlotte Spencer, Michael Palladino. **Essentials of Genetics**, 7th Edition, 2010
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| **8.2. Seminar / practical classes** | **Teaching methods** | **Observations** |
| Good laboratory practice rules. Rules on chemical and biological waste collection. Presentation of the main methods for study in genetics. | Work safety training, presentation of the laboratory equipment. Learning to work with the bright field microscope and other auxiliary devices. | 2 hour |
| Morphological study of the nucleus in interphase and cell divizion.  | Bright-field microscopic analysis of the permanent microscopic slides and the electron-microscopy images. Final conclusions. | 2 hours |
| Cytogenetic methods for karyotyping.  | Microscopic analysis of the human chromosomes. Selection of the chromosome pairs.  | 2 hours |
| DNA extraction methods.  | DNA extraction from blood. | 2 hours |
| Molecular segregation using electrophoresis  | Set of the method | 2 hours |
| Molecular techniques for screening of the mutations | Learning of work protocols and practical demonstrations. | 2 hours |
| Individual projects presentation  | Oral presentations and discussions | 2 hours |
| **Bibliography**1. Bruce Alberts: **Molecular Biology of the Cell**. 6th edition, 2014
2. William Klug, Michael Cummings, Charlotte Spencer, Michael Palladino. **Essentials of Genetics**, 7th Edition, 2010
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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** | Acquiring the concepts and theoretical information presented in the course | Written exam | 50% |
| **Seminar/practical classes** | Theme for practical works | Evaluation during semester | 10% |
| The note of the practical examination | Practical exam | 40% |
| **Minimal performance standard: Minimum passing condition is mark 5. Ability to work with bright-field microscopes and ability to identify the different compounds of the cell.** |

**Date of completion: Signature of head of discipline**

Associate Professor Ph.D. Maria Butnaru

26.09.2019

**Department approval date**

30.09.2019  **Signature of department director**

Lecturer Matei Daniela-Viorelia