**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 | **Orthetic and Prosthetic techniques** | **RE1214** |
| 2.2. Teaching staff in charge with lectures | **Associate Professor Maria Daniela Vlad, PhD** |
| 2.3. Teaching staff in charge with practical activities | **Associate Professor Maria Daniela Vlad, PhD** |
| 2.4. Year of study | **II** | 2.5. Semester | **2** | 2.6. The type of assessment | **Exam, E2** |
| 2.7. Discipline type | **Mandatory** | **Specialty 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 | **2** | **1** | **1** |
| 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 |  | 12 |
| Supplementary documentation in the library, using specialised platforms via internet and by field work |  | 4 |
| Preparation time for seminars / practical classes, study themes, reviews, portfolio and essays |  | 4 |
| 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 | Anatomy, Physiology, Methods of exploration and assessment in medical rehabilitation. |
| 4.2. of competences | To know the macroscopic and microscopic structure of organs and systems of the body. To know the techniques of exploration / assessment of the functionality of the human body. |

5. **Conditions (where applicable)**

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| 5.1. for lectures | Video logistic support |
| 5.2. for seminars / practical classes | The students will have the appropriate equipment. |

**6. Specific competences acquired**

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| **Professional competencies** | **C6.1**  | To identify the principles of manufacturing and application of orthoses, prostheses and other medical devices. |
| **C6.2**  | To explain the opportunity of choosing the type of orthosis, prosthesis or other medical devices, as well as to identify the techniques of occupational therapy adapted to the malfunction.  |

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

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| 7.1. General objective | General and specialized knowledge in the field of spinal and orthopedic prosthetics and orthotics enabling the understanding, analyzing and designing new applications in this field. |
| 7.2. Specific objectives | To familiarize with the professional activities carried out in the field of orthotics and prosthetics.  |

**8. Contents**

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| **8.1. Lectures** | **Teaching methods** | **Observations** |
| 1 | General aspects of spinal and orthopedic orthotics; | Power Point presentation | 2 hours |
| 2 | Orthotics of vertebral column: the main types of orthoses for the vertebral column - definition, classification, design/description, mechanism of action, function and indications. | Power Point presentation | 2 hours |
| 3 | Prosthetics of the intervertebral space – Biomechanics, design of prosthetic components and implantology. Vertebral body restoration through minimally invasive spine surgery technics. | Power Point presentation | 2 hours |
| 4 | Orthotics of upper limb: the main types of orthopedic orthoses - definition, classification, design/description, mechanism of action, function and indications. | Power Point presentation | 2 hours |
| 5 | Orthotics of lower limb: the main types of orthopaedic orthoses - definition, classification, design/description, mechanism of action, function and indications. | Power Point presentation | 2 hours |
| 6 | Introduction to joint prosthetics - History, definitions, types of arthroplasties; Basic characteristics of prosthetic structures; | Power Point presentation | 2 hours |
| 7 | Lower limb prosthetics – Biomechanics, Main types of knee and hip protheses; Design of the knee and hip prosthetic components; Other types of arthroplasties. | Power Point presentation | 2 hours |

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| **8.2. Practical activities - practical class**  | **Teaching methods** | **Observations** |
| 1 | Introduction to spinal implantology and prosthesis. Spinal implants. | Presentation of the paper, description and evaluation of the proposed examples, performance of practical activities.Presentation of the conclusions. | 2 hours |
| 2 | Practical applications of spinal orthotics principles: Rigid corset-type orthoses for the trunk/spine. | 2 hours |
| 3 | Evaluation of the sagittal spinal imbalance for further orthotic or prosthetic correction: Spino-pelvic parameters measurements. | 2 hours |
| 4 | Characterizations of the effectiveness of the minimally invasive vertebral restoration technics by using an experimental model of osteoporotic vertebrae. | 2 hours |
| 5 | Main types of hip/knee arthroplasty; Management of the patient with lower limb implant. | 2 hours |
| 6 | Practical applications of principles of orthopedic orthotics: Orthoses of the upper limb. | 2 hours |
| 7 | Practical applications of principles of orthopedic orthotics: Orthoses of the lower limb. | 2 hours |

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| **8.3. Bibliography:** |
| ***Mandatory:*** |
| 1. M.D. Vlad, Note de curs pe platforma de e-Learning *(Orthotics - Prosthetics, course annex,* available for the subject)
2. Kevin K. Chui, Milagros Jorje, Shen-Che Yen, Michele M. Lusardi. Orthotics and Prosthetics in Rehabilitation, Fourth Edition. Elsevier, 2019.
3. M.A. Jacobs, Noelle M. Austin. Orthotic Intervention for the Hand and Upper Extremity: Splinting Principles and Process. Editura Lippincott Williams & Wilkins. 2013.
4. M.D. Vlad, Cimenturi osoase pentru restaurare vertebrală minim invazivă *(Bone cements for minimally invasive spinal restoration).* PIM Publishing House, Iasi – 2019.
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| *Elective:* |
| 1. Robert LeMoyne, Advances for Prosthetic Technology, Springer, 2016.
2. M.D. Vlad, Biomateriale pentru proteze și implanturi (*Biomaterials for prostheses and implants*), Vol. 1-Biomateriale anorganice. PIM Publishing House, Iasi – 2020.
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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:* To know the main types of orthopedic orthoses and for the vertebral column: definition, classification, description, mechanism of action, function and indications.
* To know the main types of prostheses and prosthetic techniques.
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| Date | Holder of course / signature, | Holder of practical activities / signature, |
| 12.09.2024 | Associate Professor Maria Daniela Vlad, PhD | Associate Professor Maria Daniela Vlad, 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