**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 | | | | **Kinesitherapy. Kinesiprophilaxy.** | | **RE1209** |
| 2.2. Teaching staff in charge with lectures | | | | **Lecturer Dragoș Sardaru, PhD** | | |
| 2.3. Teaching staff in charge with practical activities | | | | **Lecturer Dragoș Sardaru, PhD** | | |
| 2.4. Year of study | **II** | 2.5. Semester | **1+2** | 2.6. The type of assessment | **Exam, E1, 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 | **4** | **2** | | **2** | | | |
| Semester 2 | **3** | **1** | | **2** | | | |
| 3.4. Total number of learning hours: | **98** | 3.5. Of which: Courses | **42** | 3.6. Of which: Seminars / practical classes: | | | **56** |
| 3.7. Distribution of individual study time: | | | | | Hours sem. 1 | Hours sem. 2 | |
| Study time using course book materials, bibliography and hand notes | | | | | 12 | 10 | |
| Supplementary documentation in the library, using specialised platforms via internet and by field work | | | | | 12 | 13 | |
| Preparation time for seminars / practical classes, study themes, reviews, portfolio and essays | | | | | 10 | 5 | |
| Tutorship | | | | | 4 | 4 | |
| Examinations | | | | | 4 | 4 | |
| Other activities | | | | | 10 | 5 | |
| Total hours of individual study (*without examinations*) | | | | | **44** | **33** | |
| 3.8. Total hours per semester | | | | | **100** | **75** | |
| 3.9. Number of credits | | | | | **4** | **3** | |

**4. Preconditions (where applicable)**

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| 4.1. of curriculum | Anatomy, Biomechanics, Pathophysiology and Kinesiology basic notions. |
| 4.2. of competences | Knowledge of locomotion mechanisms, posture, types of movements. The use of appropriate parameters in the techniques of increasing joint mobility, muscle strength, coordination and balance, in improving some modified parameters (cardiovascular, respiratory, neuromuscular, etc.). The development of adequate scores for assessing the reduction of the functional deficit and socio-professional independence |

5. **Conditions (where applicable)**

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| 5.1. for lectures | Video, white board |
| 5.2. for seminars / practical classes | Functional anatomy model for different joints. Biomechanics and physiological charts for muscle and joint action. |

**6. Specific competences acquired**

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| **Professional competencies** | **C1.3** | Application of kinesitherapy program in correlation with functional diagnosis, medical clinical diagnosis, secondary prophylaxis. |
| **C1.4** | Development and implementation of new protocols of kinesitherapy centered on evidence-based practice |
| **C1.5** | Development and implementation of new physical therapy protocols. Treatment of various diseases and conditions of the human body by using the specific means of physical therapy.  Treatment of various diseases and conditions of the human body by using specific means of physical education. |
| **C2.1** | Defining the general and local effects of medical massage, describing the main massage techniques for different body regions, with their indications and contraindications |
| **C2.3** | Apply massage programs appropriate to the pathology and the treated region.  Massage techniques in medical recovery. |
| **C2.4** | Utilization of adequate parameters in augmenting joint range of motion, muscle force, muscle power, coordination, equilibrium, and amelioration of modified physiological parameters. |
| **C3.2** | Understanding the basic principles that are used in main concepts of rehabilitation in the field of physiotherapy |

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

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| 7.1. General objective | To understand the general foundational concepts about therapeutic exercise, influence of movement therapy on different sistems of the human body, prevention, health an wellnes.  To be able to integrate combined notions of basic sciences like anatomy, physiology, biomechanics, biochemistry and kinesiology in order to understand how to safely apply therapeutic exercises in rehabilitation of different medical pathological conditions and to promote human health.  To be able to transfer scientific and new research data into an evidence-based clinical practice. |
| 7.2. Specific objectives | To understand the application of the basic science in clinical practice and be able to apply different techniques related to:  a. Range of motion deficits  b. Stretching techniques for impaired mobility  c. Peripheral joint mobilization  d. Resistance exercice for impaired muscle performance  e. Exercice for impaired balance  To be abble to apply in a clinical seting principles of intervention in:  a. Soft tissue injury, repair and management  b. Joint, connective tissue and bone disorders and management  c. Surgical interventions and postoperative management  d. Peripheral nerve disorders and management |

**8. Contents**

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| **8.1. Lectures/ 1st Semester** | | **Teaching methods** | **Observations** |
| 1 | Generalities. Definition. Terminology. The importance and history of the discipline. General principles. General objectives | PPT presentation, discussion | 2h |
| 2 | Aspects of physical function. Definition of kinesiological functional terms. Types of therapeutic interventions in physiotherapy. | PPT presentation, discussion | 2h |
| 3 | The clinical decision process. Evidence-based clinical practice. Clinical patient management model. | PPT presentation, discussion | 2h |
| 4 | Range of motion: passive, active. Precautions and contraindications in techniques to promote range of motion. Principles and procedures in their application: examination, evaluation, application of passive and active mobilization | PPT presentation, discussion | 2h |
| 5 | Self-assisted mobilization. Continuous passive movement. Movement through functional models. | PPT presentation, discussion | 2h |
| 6 | Stretching for impaired mobility. Definition of terms related to mobility and stretching: flexibility, hypomobility, contracture, contracture types, interventions to increase soft tissue mobility. | PPT presentation, discussion | 2h |
| 7 | Overstretching and hypermobility. Properties and response of soft tissue to immobilization and stretch: mechanical and neurophysiological properties of contractile tissue, mechanical properties of non-contractile tissue. | PPT presentation, discussion | 2h |
| 8 | Determinants, types and effects of stretching application: alignment and stabilization, intensity, duration, speed, frequency, modality. Neuromuscular stretching. Integrating function into stretching. Procedural guide in the application of stretching: patient examination and assessment, preparation, application, post-stretching status. Techniques adjacent to the application of stretching techniques. Precautions. | PPT presentation, discussion | 2h |
| 9 | Mobilization of peripheral joints. Definition of terms: mobilization/manipulation, self-mobilization, mobilization with movement, physiological movement, accessory movement, thrust, manipulation under anesthesia. | PPT presentation, discussion | 2h |
| 10 | Basic concepts in joint movement: joint shape, types of movements, passive-angular stretching versus passive-linear capsulo-ligamentous stretching. Effects of joint movement. Clinical indications: pain, muscle protection and spasm; reversible joint hypomobility, subluxations/positional errors, progressive limitation, functional immobility. | PPT presentation, discussion | 2h |
| 11 | Contraindications and precautions for joint mobilization: hypermobility, joint effusion/hydrops, inflammation, general conditions. Procedural guidance in the application of joint mobilization: examination and evaluation; degrees and dosage of movement; positioning and stabilization; treatment force and direction of movement; speed, pace and duration; the patient's response to treatment. Mobilization with movement – principles of application in clinical practice, pain as a guide. | PPT presentation, discussion | 2h |
| 12 | Resistive exercise in muscle performance deficit. Definition and principles: power, force, resistance, principle of overload, principle of reversibility, principle of SAID. Adaptation to resistive exercise: determinants in the production of muscle tension, physiological adaptation. Determinants in resistance exercise: alignment and stabilization, intensity, volume, frequency, duration, recovery period, mode, speed, periodization, integration into function. | PPT presentation, discussion | 2h |
| 13 | Types of resistive exercises: isometric, dynamic concentric – eccentric, dynamic constant – variable, isometric, isokinetic, plyometric, isoinertial, in open and closed kinetic chain. Precautions: valsalva maneuver, overtraining and exhaustion, exercise-induced muscle pain, substitution movements, pathologic fractures. Contraindications: pain, inflammation, severe cardiovascular diseases. Ways of producing resistance: manual, neuro-proprioceptive facilitation, mechanical, selective resistance regimes. | PPT presentation, discussion | 2h |
| 14 | Aerobic exercise. Definition and principles: fitness, maximal oxygen consumption, endurance, training, adaptation, myocardial oxygen consumption, deconditioning; energy cost and efficiency. Physiological response to aerobic exercise. Determining factors: intensity, duration, frequency, mode, principle of reversibility. Program: warm-up period, aerobic exercise, cool-down period, applications. Physiological changes. | PPT presentation, discussion | 2h |

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| **8.1. Lectures/ 2nd Semester** | | **Teaching methods** | **Observations** |
| 1 | Exercise in balance deficit. Concepts: Balance, balance control, sensory system in balance control; motor strategies in balance control. Deficiency of sensory afferents (inputs). Sensory-motor integration. Biomechanical and motor control deficit. Impaired balance in the elderly and determined by medication. Dysfunctional Balance Management: Review, Evaluation; balance training; health and environmental factors. Evidence-based exercise program for balance. | PPT presentation, discussion | 2h |
| 2 | Principles of intervention for soft tissue injury, repair and management. Soft tissue lesions: examples of soft tissue lesions–musculoskeletal disorders; Clinical conditions resulting from trauma or pathology; Severity of tissue injury; Irritability of tissue: Stages of inflammation and repair | PPT presentation, discussion | 2h |
| 3 | Management during acute stage: tissue response – Inflamation; management guidelines in protection phase. Management during subacute phase. Tissue response – repair and healing; management guidelins in controlled motion phase. Management in chronic stage: Maturation and remodeling of tissue; management guidelines in return to function phase. | PPT presentation, discussion | 2h |
| 4 | Principles of intervention for joint, connective tissue and bone dissorders and management. Arthritis/arthrosis: clinical signs and symptoms, rheumatoid arthritis - degenerative joint diseases. Myofascial pain sindrome. Fractures and post-traumatic immobilization: risk factors, bone tissue regeneration, principles of post-immobilization management. | PPT presentation, discussion | 2h |
| 5 | Principles of intervention for surgical interventions and postoperative management. Guidelines for preoperative and postoperative management. Potential postoperative complications. Common orthopaedic surgeries an postoperative management. Surgical approaches – open, arthroscopically assisted procedures. Use of tissue grafts: repair, reatachment, reconstruction. Joint procedures. | PPT presentation, discussion | 2h |
| 6 | Principles of intervention for peripheral nerve disorders and management. Nerve structure, nervous system movility and common sites of injury to peripheral nerves. Nerve injury and recovery: mechanics of nerve injury, classification, recovery of nerve injury. | PPT presentation, discussion | 2h |
| 7 | Neural tension disorders: symptoms and signs of nerve mobility impairment. Principles of managment. | PPT presentation, discussion | 2h |

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| **8.2. Practical activities - practical class/ 1st Semester** | | **Teaching methods** | **Observations** |
| 1 | Overview of therapeutic modalities in medical kinesiology. Categories of techniques. Corrective musculoskeletal posture – practical.- PostArt 1 | Ppt presentation, video presentations, interactive discussions, practical demonstrations, applications | 2h |
| 2 | Passive movement. Techniques for passive mobilization of the joints of the lower body. Evaluation of end-feel sensation. Physiological and accessory mobilization. – MobInf 1 | 2h |
| 3 | Techniques for passive mobilization of the joints of the lower body. Evaluation of end-feel sensation. Physiological and accessory mobilization. – MobInf 2 | 2h |
| 4 | Techniques for passive mobilization of the joints of the upper body. Evaluation of end-feel. Physiological and accessory mobilization. – MobSup 1 | 2h |
| 5 | Techniques for passive mobilization of the joints of the upper body. Evaluation of end-feel. Physiological and accessory mobilization. – MobSup 2 | 2h |
| 6 | Techniques for passive mobilization of spinal segment. Evaluation of end-feel. Physiological and accessory mobilization. – SpinMob 1 | 2h |
| 7 | Techniques for passive mobilization of spinal segment. Evaluation of end-feel. Physiological and accessory mobilization. – SpinMob 2 | 2h |
| 8 | Stretching techniques for the muscles of the upper body. Evaluation of muscle length. –MuscStretch 1 | 2h |
| 9 | Stretching techniques for the muscles of the lower body. Evaluation of muscle length. –MuscStretch 2 | 2h |
| 10 | Stretching techniques for the muscles of the upper body. Evaluation of muscle length. –MuscStretch 3 | 2h |
| 11 | Voluntary muscle activation. Range of muscle action. The interior and exterior range of the muscle contraction action. Effects on myo-fascial structures. Practical application of the upper segment. – VolMusc 2 | 2h |
| 12 | Voluntary muscle activation. Range of muscle action. The interior and exterior range of the muscle contraction action. Effects on myo-fascial structures. Practical application of the upper segment. – VolMusc 3 | 2h |
| 13 | Voluntary muscle activation. Range of muscle action. The interior and exterior range of the muscle contraction action. Effects on myo-fascial structures. Practical application of the upper segment. – VolMusc 3 | 2h |
| 14 | Voluntary and involuntary active movement. The use of neuromuscular reflexes in active-involuntary treatment. - InvMusc 1 | 2h |

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| **8.2. Practical activities - practical class/ 2nd Semester** | | **Teaching methods** | **Observations** |
| 1 | Postural assessment. Axial changes in the frontal, sagittal and transverse planes. Influence of muscle chains. Practical application. – PostEva 1 | Ppt presentation, video presentations, interactive discussions, practical demonstrations, applications | 2h |
| 2 | Activation of muscle kinetic chains as a function of axial body changes. Therapeutic physical exercise in postural reeducation. Practical application.- PostEva 2 | 2h |
| 3 | Auto-passive and active types of mobilization through technical devices. Pulleytherapy, suspension therapy and spinal elongation. Concept, parameters of use in recommended pathologies. Practical application. - DispTec 1 | 2h |
| 4 | Concepts and functional rehabilitation in low back pain. The role of spinal flexion and extension in the acute and chronic period. The phenomena of centralization and peripheralization. Practical application. - LumbReed 1 | 2h |
| 5 | Concepts and functional rehabilitation in low back pain. Therapeutic physical exercise in the stabilization of the spinal segment. Feed-back and feed-forward in spinal motor control. Practical application. - LumbReed 2 | 2h |
| 6 | Concepts of functional re-education of the cervical spine segment. Therapeutic physical exercise in the re-education of joint mobility and stability; muscle strength and reactivity. Re-education in cervico-brachial syndrome, syndr. of gorge, syndr. faceted. CervReed 1 | 2h |
| 7 | Concepts of functional re-education of the cervical spine segment. Therapeutic physical exercise in the re-education of joint mobility and stability; muscle strength and reactivity. Re-education in cervico-brachial syndrome, thoracic outlet syndrome, facet syndrome. CervReed 2 | 2h |
| 8 | Therapeutic physical exercise for the functional re-education of the scapulo-humeral joint complex: impingement syndrome, modification of scapulo-humeral motor functional synchronism. -ScReed 1 | 2h |
| 9 | Therapeutic physical exercise for the functional re-education of the lower limb: disjunctions and joint instability (hip, knee, ankle). Stimulation of proprioception. - ReedMInf 1 | 2h |
| 10 | Therapeutic physical exercise for the functional re-education of the lower limb: movement through functional models, transfer of gains (strength, power, resistance) from static exercise to functional exercise (hip, knee, ankle).- ReedMInf 2 | 2h |
| 11 | Concepts of neuromotor reeducation. Proprioceptive neuro-muscular facilitation: movement patterns, philosophy, basic principles, basic procedures. PNF 1 | 2h |
| 12 | Concepts of neuromotor reeducation. Proprioceptive neuro-muscular facilitation: segmental and global neuromuscular control, proprioceptive strengthening, muscle inhibition. PNF 2 | 2h |
| 13 | Therapeutic exercise in adaptation to effort. EfAd 1 | 2h |
| 14 | Therapeutic exercise in pulmonary rehabilitation.- | 2h |

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| **8.3. Bibliography:** |
| ***Mandatory:*** |
| 1. Course and practical works notes posted on e-Learning platform 2. Kisner C, Colby LA, [Borstad](https://www.amazon.com/s/ref=dp_byline_sr_book_3?ie=UTF8&field-author=John+Borstad+PT++PhD&text=John+Borstad+PT++PhD&sort=relevancerank&search-alias=books)J, Therapeutic Exercise: Foundations and Techniques, 7th ed, F.A. Davis, Company, Philadelphia, 2017. 3. O’Sullivan S, Schmitz, TJ, Fulk G, Physical rehabilitation, 7th ed, , F.A. Davis, Company, Philadelphia 2019. 4. Plowmand Sharon A., Smith Denise L. **Exercise Physiology. For health, fitness and performance.** 4th ed. Baltimore-Philadelphia, Lippincott Williams, 2014 5. Hoogenboom B, Voight M, Prentice W, Musculoskeletal Interventions: Techniques for Therapeutic Exercise, 4th ed, McGraw-Hill Education, 2021. 6. Sardaru DP, Onu I, Matei DV. Evaluarea Amplitudinilor Articulare, Ed. Gr. T. Popa U.M.F. Iași, 2021 |
| ***Elective:*** |
| 1. Muscolino Joseph E, **Kinesiology. The skeletal system and muscle function.** 2nd ed. Missouri, Elsevier, 2011. 2. Norkin C Cynthia. **Measurement of joint motion. A guide to goniometry**. 4th ed. Philadelphia, Devis Company, 2009. 3. Thompson C John. **Netter’s concise orthopaedic anatomy**. 2nd ed. Saunders Elsevier. 4. Buckup F. **Clinical tests for the musculoskeletal system**. 2nd ed. Stuttgart.New York. Thieme. 2008. |

**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 be able of presenting and safely applying kinesiology methods and techniques. * To take in consideration disfunctions and functional limitation when applying physiotherapy technics. | | | |

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| Date | Holder of course / signature, | Holder of practical activities / signature, |
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6.09.2024 Lecturer Sardaru Dragos PhD Lecturer Sardaru Dragos, 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 |