# PHYSICAL MEDICINE AND REHABILITATION


# CLINICAL MEDICINE

## THE SIXTH YEAR OF STUDIES

School year 2025/2026.

Subject:

# PHYSICAL MEDICINE AND REHABILITATION

The course is evaluated with 4 EPTS. There are 4 hours of active classes per week (2 hours of lectures and 2 hours of work in a small group)

# TEACHERS AND ASSOCIATES:

| | Name and surname | E-mail address | vocation |
|---|---|---|---|
| 1. | Ana Divjak | ana.divjak@gmail.com | Assistant Professor |
| 2. | Vesna Grbović | grbovicvesna72@gmail.com | Assistant Professor |
| 3. | Kristijan Krstić | dr.krstic.kristijan@gmail.com | Teaching Associate |

# COURSE STRUCTURE:

| **Module** | **Name of the module** | **Weeks** | **Lectures per week** | **Work in a small group per week** | **Teacher-leader of the module** |
|---|---|---|---|---|---|
| 1 | Module 1 | 4 | 2 | 2 | Asst. Prof. Ana Divjak |
| 2 | Module 2 | 4 | 2 | 2 | Asst. Prof. Ana Divjak |
| 3 | Module 3 | 7 | 2 | 2 | Asst. Prof. Ana Divjak |
| | | | | | Σ 15+15=30 |

# EVALUATION:

The student masters the subject by modules. The grade is equivalent to the number of points earned (see tables). Points are earned in three ways:

**ACTIVITY DURING THE LESSON:** In this way, the student can gain up to 30 points by taking out 2 questions to check the activities from that week's lesson in the last class of work in a small group, answering them and in accordance with the demonstrated knowledge, gaining from 0 - 2 points.

**TESTS BY MODULES:** In this way, the student can gain up to 30 points according to the scheme attached for evaluation by modules.

**FINAL (VERBAL) EXAM**: In this way, the student can gain 40 points, 10 points on the final skills test and 30 points on the verbal exam.
The final skills check implies that the student practically performs two skills: to perform functional testing on a patient or to practically apply a physical agent on a patient.
If the student does not get more than 50% of the points on the final skills test, he cannot take the verbal part of the exam. The oral part of the exam implies that the student verbal answers five questions (each question is worth 0-6 points).
If the student does not get more than 50% of the points in the verbal exam, he has not passed the exam.

| MODULE | | MAXIMUM POINTS | | | |
|---|---|---|---|---|---|
| | | **Activity during classes** | **Tests by modules** | **Final (verbal) exam** | **Σ** |
| 1 | Physical agents: Thermotherapy, Mechanotherapy, Electrotherapy I, Electrotherapy II | 8 | 10 | | 18 |
| 2 | Physical agents: Magnetotherapy, Phototherapy, Hydrotherapy and Balneotherapy, Kinesitherapy | 8 | 10 | | 18 |
| 3 | Prosthetics and orthotics, Rehabilitation in orthopedics and traumatology, Rehabilitation in CMN lesions, Rehabilitation in PMN lesions, Rehabilitation in rheumatology, Rehabilitation in pulmonology and of cardiology, Children's rehabilitation | 14 | 10 | | 24 |
| | | | | 40 | 60 |
| **Σ** | | **30** | **30** | **40** | **100** |

**CONSULTATIVE TEACHING:** Consultations can be scheduled with Asst. Prof. Ana Divjak (ana.divjak@gmail.com), Asst. Jelena Milošević (jecas0109@gmail.com), Dr. Kristijan Krstić (dr.krstic.kristijan@gmail.com), Dr Kristina Mladenović ((dr.krstic.kristijan@gmail.com).

**The final grade is formed as follows:**

In order to pass the course, the student must obtain a minimum of 51 points and pass all modules.

To pass the module the student must:
1. obtain more than 50% points on that module
2. acquire more than 50% of the points provided for the teaching activity in each module
3. to pass the test from that module, i.e. to have more than 50% correct answers
4. pass the final verbal exam.

| **The number of points earned** | **Rating** |
|---|---|
| 0 - 50 | **5** |
| 51 - 60 | **6** |
| 61 - 70 | **7** |
| 71 - 80 | **8** |
| 81 - 90 | **9** |
| 91 - 100 | **10** |

# TESTS BY MODULES

## MODULE 1.

**FINAL TEST**
**0-10 points**

**EVALUATION OF THE FINAL TEST**
The test has 20 questions. Each question is worth 0.5 points

## MODULE 2.

**FINAL TEST**
**0-10 points**

**EVALUATION OF THE FINAL TEST**
The test has 20 questions. Each question is worth 0.5 points

## MODULE 3.

**FINAL TEST**
**0-10 points**

**EVALUATION OF THE FINAL TEST**
The test has 20 questions. Each question is worth 0.5 points

## LITERATURE:

| Module | The name of the book | Authors | Publisher | The library |
|---|---|---|---|---|
| | **Physical medicine and rehabilitation** | Jevtić Milorad | Faculty of Medicine, Kragujevac, 1999. | Has |
| | **Medical rehabilitation** | Veljković Miodrag | Faculty of Medicine, Kragujevac, 2001. | Has |
| | **Manual for practical teaching in clinical biomechanics** | Dušica Đorđević<br>Katarina ParezanovićIlić<br>Predrag Bogojević | Faculty of Medical Sciences, Kragujevac, 2012. | Has |
| | **Physical agents in health tourism** | Tanja Zečević Luković | Faculty of Hotel Management and Tourism in Vrnjačka banja, University of Kragujevac, 2021. | Does not have |
| | **Health communication skills** | Valadimir Janjić<br>Marina Petrović | Faculty of Medical Sciences, University of Kragujevac, 2017. | Has |

**All lectures are available on the website of the Faculty of Medical Sciences:**
**www.medf.kg.ac.rs**

# THE PROGRAM:

## FIRST MODULE: PHYSICAL AGENTS 1

TEACHING UNIT 1 (FIRST WEEK)

| THERMOTHERAPY | |
|---|---|
| Lectures 2 hours | Exercises 2 hours |
| • Biophysical properties of heat.<br>• Heat transfer.<br>• Physical and physiological effects of heat.<br>• Paraffinotherapy. Peloidotherapy.<br>• Parafangotherapy. Psamotherapy. Hot air therapy. Sauna.<br>• Other thermotherapy procedures.<br>• Cryotherapy - physical and physiologica<br>• action, application technique, indications and contraindications.<br><br>• **What a student should know:**<br>• Learn and understand the physical properties of heat<br>• Adopt a division of thermotherapy<br>• Learn the basic characteristics of the agents used in thermotherapy<br>• Learn the differences between endogenous and exogenous heat, dry and moist heat<br>• To learn agents from hot and cold different zones | • What are the precautions when working<br>• with thermotherapy agents<br>• What is dry packing and why is it used?<br>• How to dose thermotherapy agents<br><br>• **What a student should know:**<br>• Method of preparation of paraffin<br>• Methods of paraffin application<br>• Cryotherapy application technique<br>• Cryomassage technique |

TEACHING UNIT 2 (SECOND WEEK)

| MECHANOTHERAPY | |
|---|---|
| Lectures 2 hours | Exercises 2 hours |
| **Mechanotherapy**<br>• Division. Manual massage (division,<br>• physiological action, general principles of massage, forms of massage, indications and contraindications). Special forms of massage (connective tissue massage, periosteum massage, nerve point massage, segmental massage).<br>• Apparatus massage (pneumomassage<br>• vibromassage, hydromassage). Hypobaric procedures. Manual therapeutic techniques (manipulations, manual stretching of soft tissues). Extension procedures - traction. | • Sonotherapy (infrasound and ultrasound).<br>• Physical properties of ultrasound.<br>• Physical and physiological effects of ultrasound.<br>• Ultrasound application technique.<br><br>• **What a student should know:**<br>• Method of application of ultrasound<br>• Undesirable effects when using ultrasound<br>• Types of contact media and reasons for their use<br>• Subaquatic technique and direct application technique |

| | |
|---|---|
| **Sonotherapy (infrasound and ultrasound).**<br>• Physical properties of ultrasound. Physical and physiological effects of ultrasound. Ultrasound application technique.<br><br>**What a student should know:**<br>• Learn and understand the physical characteristics of mechanotherapy<br>• Adopt a division of mechanotherapy<br>• To learn the basic characteristics of the agents used in mechanotherapy<br>• Learn the effects of different mechanotherapy<br>• Learn indications and contraindications for mechanotherapy | |

TEACHING UNIT 3 (THIRD WEEK)

| **ELECTROTHERAPY 1** | |
|---|---|
| Lectures 2 hours | Exercises 2 hours |
| • Electrotherapy. Direct currents.<br>• Direct current.<br>• Special forms of galvanic current.<br>• Direct impulse currents<br>• Exponential currents<br><br>**What a student should know:**<br>• Learn and understand the physical properties of electricity.<br>• Understand the division of electrotherapy.<br>• To learn the most important characteristics of direct current.<br>• Get to know and understand the special forms of galvanic current.<br>• To learn and understand and differentiate between DC impulse currents (non-faradic, DDS, exponential currents, modulated currents).<br>• Understand the effects of direct currents in certain pathological conditions. | • Presentation of electrotherapy apparatus<br>• Pole determination technique for galvanic current<br>• The technique of applying stable galvanization<br>• Application technique of galvanic current, diadynamic currents, interference currents, TENS therapy<br>• Technique of electrostimulation of paretic and paralytic muscles with exponential currents<br><br>**What a student should know:**<br>• Learn and master the techniques of applying stable electroplating<br>• Practical application of electrophoresis of certain drugs<br>• Determination of the dose for electrophoresis of certain drugs<br>• To learn the technique of application of galvanic current, diadynamic currents<br>• To learn the application technique of electrostimulation of paretic and paralytic muscles with exponential currents<br>• To learn the application technique of modulated electrostimulation of inactive hypotrophic muscles currents |

TEACHING UNIT 4 (FOURTH WEEK)

| ELECTROTHERAPY 2 | |
|---|---|
| Lectures 2 hours | Exercises 2 hours |
| • Electrotherapy part II. Alternating currents<br>• Low-frequency currents (faradic current).<br>• Medium frequency currents (IFC, TENS,<br>• sinusoidal modulated currents).<br>• High frequency currents<br>• Indications and contraindications for the application of alternating currents<br><br>• **What a student should know:**<br>• Learn and understand the division of low-frequency currents, as well as their physical characteristics.<br>• Learn and understand the physical and physiological actions, as well as the methods of application and dosing of medium-frequency current (IFC, TENS, sinusoidal modulated current).<br>• Learn and understand the physical and physiological actions, as well as the methods of application and dosage of high-frequency current (KTD, ultrashort-wave diathermy, microwave diathermy).<br>• Learn and understand electrodiagnostics | • The technique of applying alternating currentsto the patient<br>• Dosing of alternating currents<br>• Learn the contraindications for the application of certain forms of alternating current<br>• Precautions when applying KTD<br>• Application of TENS in painful conditions<br><br>• **What a student should know:**<br>• To learn and master the techniques of application and dosing of alternating currents<br>• Learn and master the precautionswhen applying KTD<br>• Application of TENS in painful conditions |

## SECOND MODULE: PHYSICAL AGENTS 2

TEACHING UNIT 5 (FIFTH WEEK)

| MAGNETOTHERAPY AND LASEROTHERAPY | |
|---|---|
| Lectures 2 hours | Exercises 2 hours |
| • Laser therapy and magnetotherapy<br>• Application method, dosage,<br>• indicationsand contraindications<br>• **What a student should know:**<br>• Learn and understand the physical,<br>• physiological and therapeutic effects of laser light<br>• Learn and understand the physiological and<br>• therapeutic action of the pulsating electromagnetic field<br>• Familiar method of application ofpulsating electromagnetic field<br>• Understand pulsedelectromagneticfield dosing | • Presentation of the device<br>• for electromagnetic field therapy<br>• Presentation of the laser therapy device<br><br>• **What a student should know:**<br>• Acquaintance of students with operating the device for electromagnetic field therapy<br>• Learn the technique of electromagnetic field application<br>• Learn electromagnetic field dosing<br>• Acquaintance of students with the operation of the laser therapy device |

| | |
|---|---|
| • Learn the indications and contraindications forpulsed electromagnetic field<br>• Failure to learn and understand the characteristics of laser light sources<br>• An unlearned way of applying laser light<br>• Learn how to dose laser light<br>• Learn the indications and contraindications forthe application of laser light | • Learn the technique of laser application<br>• Learn laser dosing in different clinical modalities |

TEACHING UNIT 6 (SIXTH WEEK)

| **PHOTOTHERAPY** | |
|---|---|
| Lectures 2 hours | Exercises 2 hours |
| • Phototherapy<br>• UV rays<br>• IR-rays<br>• Diagnostic application of ultraviolet and infrared rays.<br><br>**What a student should know:**<br>• To learn the physical properties of light and the biological action of light energy<br>• Learn and understand the physical and physiological action of ultraviolet (UV) rays<br>• Get to know artificial sources of UV rays<br>• Understand the method of application and dosage of UV rays<br>• Learn the indications and contraindications for the therapeutic use of UV rays<br>• To learn the diagnostic application of ultraviolet rays<br>• Understand the physical and physiological effects of infrared (IR) rays<br>• Get to know artificial sources of IR rays<br>• Learn and understand the method of application and dosage of IR rays<br>• Learn the indications and contraindications for the therapeutic application of IR rays<br>• Learn the diagnostic application of infrared rays | • Display of quartz lamp<br>• IR lamp display<br><br>• **What a student should know:**<br>• Introducing students to the handling of aquartz lamp<br>• Master the technique of applying UV rays<br>• Learn the technique of biodose determination<br>• Acquaintance of students with handling thelamp for IR radiation<br>• Master the technique of applying IR radiation |

TEACHING UNIT 7 (SEVENTH WEEK)

| HYDRO AND BALNEOTHERAPY | |
|---|---|
| Lectures 2 hours | Exercises 2 hours |
| • Hydro and Balneotherapy<br>• The importance of the balneocomplex inthe re-education of motor functions<br><br>**What a student should know:**<br>• Learn the physical properties of water.<br>• Learn and understand the physiological<br>• effects of cold and hot water.<br>• Learn most hydrothermal<br>• procedures.<br>• Learn most hydrokinetic procedures.<br>• Learn most hydrochemical<br>• procedures.<br>• Understand balneotherapy –<br>• naturalfactors, classification of mineral waters and method of use. | • Application of local and generalhot andcold baths.<br>• Hydroelectric single-cell, two-cell,threecell and four-cell baths.<br><br>**What a student should know:**<br>• Master the art of applying local andgeneralhot and cold baths. Master the skill of applying coatings (Prisnic's coating).<br>• Master the skill of applying varioustypes ofshowers.<br>• Master the skill of application and useoftherapeutic bathtubs, hydroelectric one-cell, two-cell, three-cell and four-cell baths. |

TEACHING UNIT 8 (EIGHTH WEEK)

| KINESITHERAPY | |
|---|---|
| Lectures 2 hours | Exercises 2 hours |
| • Kinesitherapy<br>• Modern methods of kinesitherapy.<br>• Dosage in kinesitherapy.<br>• Clinical problems<br>• Inactivity and its consequences<br><br>**What a student should know:**<br>• Learn and understand the physiological and neurophysiological bases of kinesitherapy. The anatomical basis of kinesitherapy and the kinesiological basis of kinesitherapy to learn.<br>• Learn the types of therapeutic exercises and thegoals of therapeutic exercises.<br>• Accept and adopt modern methods of kinesitherapy.<br>• Learn dosing in kinesitherapy.<br>• Adopt indications and contraindications fortherapeutic exercises.<br>• To understand the importance of inactivity in dysfunctions of LMA | • Equipment of the kinesitherapy hall.<br>• Kinesiological evaluation of locomotor apparatus functions.<br>• Use of authorized methods Bobath, Vojta, Kabath<br><br>**What a student should know**<br>• Equipment of the kinesitherapy hall<br>• Kinesiological evaluation of<br>• locomotor apparatus functions<br>• Kinesitherapy in children<br>• Use of authorized methodsBobath,<br>• Vojta, Kabath |

# THIRD MODULE: PROSTHETICS AND ORTHOTICS REHABILITATION IN ORTHOPEDICS, TRAUMATOLOGY AND NEUROLOGY

TEACHING UNIT 9 (NINTH WEEK)

| PROSTHETICS AND ORTHOTICS | |
|---|---|
| Lectures 2 hours | Exercises 2 hours |
| • Definition of the concept of rehabilitation.<br>• Domain and connection with other branches of medicine.<br>• Impairment, disability and handicap<br>• Basic principles of prosthetic<br>• rehabilitation<br>• Rehabilitation of patients after lower<br>• limb amputation in stages<br>• Rehabilitation of patients after upper<br>• extremity amputation<br>• Communication skills with people with disabilities<br><br>**What a student should know:**<br>• Learn the causes of disability<br>• Define impairment, disability, handicap<br>• problems accompanying disability<br>• communication skills with disabled people<br>• Examination of patients after lower limb amputation<br>• Permitted and prohibited activities after implanting an artificial hip<br>• Exercise program after implanting an artificial hip<br>• Exercise program after implanting an artificial knee | • Development of a medical rehabilitation plan<br>• Mental aspects of disability<br>• Examination of patients after amputation<br>• Display of knee prosthesis<br>• Display of orthoses for the spinal column<br>• Display of orthopedic footwear<br>• Display of mobility aids<br><br>**What a student should know:**<br>• Development of a medical planrehabilitation for certain diseases<br>• Principles of communication with persons with disabilities<br>• Clinical picture of patients with amputations<br>• Stump bandaging and methods of execution<br>• Postoperative stump care<br>• Communication with people with disabilities |

TEACHING UNIT 10 (TENTH WEEK)

| REHABILITATION IN ORTHOPEDICS AND TRAUMATOLOGY | |
|---|---|
| Lectures 2 hours | Exercises 2 hours |
| • Soft tissue injuries: inflammatory phase and physical treatment<br>• Soft tissue injuries: reparation phase and physical treatment<br>• Mechanism of occurrence, clinical picture and physical treatment of various post-traumatic conditions<br>• Complex regional pain syndrome, mechanism of origin, clinical picture | • Clinical examination of orthopedicand post-traumatic patients<br>• Development of a medical rehabilitationplan after injury to soft tissues and bones<br>• Development of a medical rehabilitationplan after hip endoprosthesis installation |

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| and physical treatment<br>• Physical treatment of patients with an artificial hip<br>• Physical treatment of patients with an artificial knee<br><br>**What a student should know:**<br>• Examination of patients with various post-traumatic conditions<br>• Permitted and prohibited activities after implanting an artificial hip<br>• Exercise program after implanting an artificial hip<br>• Exercise program after implanting an artificial knee | **What a student should know:**<br>• To learn the basic techniques of clinical<br>• examination of orthopedic and post-traumatic patients<br>• Evaluation of locomotor apparatus functions<br>• Learn how to develop a medical<br>• rehabilitation plan after soft tissue injuries and after bone fractures<br>• To learn the optimal application of physical<br>• agents after bone fractures and complications after fractures<br>• Master the creation of a medical<br>• rehabilitation plan after the installation of a hip endoprosthesis. Salvati-Wilson scale |

TEACHING UNIT 11 (ELEVENTH WEEK)

| **REHABILITATION OF CMN LESIONS** | |
|---|---|
| Lectures 2 hours | Exercises 2 hours |
| • Etiology of CNS damage<br>• Levels of CMN damage - localization of the lesion.<br>• Plasticity of brain structures, that is, the ability of brain structures to change their functional structure and organization<br>• Spastic synergisms of the upper and lower limbs in pyramidal lesions<br>• Limb positioning in hemiplegics<br>• Medical rehabilitation program for hemiplegics<br>• Physical treatment of hand edema in hemiplegic patients<br>• Electrostimulation of paretic muscles in hemiplegics<br>• Neuromotor seizures in Parkinson's disease<br>• The most common causes of symptomatic parkinsonism<br><br>**What a studens should know:**<br>• Clinical picture of multiple sclerosis<br>• Physical treatment of spastic muscles<br>• Physical treatment of patients with MS<br>• Physical treatment of complications in patients with lesions of the central nervous system<br>• Communication skills with people with | • Spastic synergisms of the upper and lower limbs in pyramidal lesions<br>• Limb positioning in hemiplegics<br>• Medical rehabilitation program for hemiplegics<br>• Physical treatment of hand edema in hemiplegic patients<br>• Electrostimulation of paretic muscles in hemiplegics<br>• Neuromotor seizures in Parkinson's disease<br>• Clinical picture of multiple sclerosis<br>• Physical treatment of spastic muscles<br>• Physical treatment of patients with MS<br>• Communication skills with people with handicaps and disabilities<br><br>**What a student should know:**<br>• Limb positioning in hemiplegics<br>• Medical rehabilitation program for hemiplegics<br>• Physical treatment of hand edema in hemiplegic patient<br>• Electrostimulation of paretic muscles in hemiplegics<br>• Physical treatment of patients with Parkinson's disease |

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|---|---|
| handicaps and disabilities<br><br>**What a student should know:**<br>• Clinical picture depending on the level of CMN damage - localization of the lesion.<br>• Plasticity of brain structures,<br>• Adopt spastic synergies<br>• Limb positioning in hemiplegics<br>• Program of medical rehabilitation of hemiplegics based on clinical findings<br>• Physical treatment of hand edema in hemiplegic patients<br>• Electrostimulation of paretic muscles in hemiplegics<br>• Neuromotor seizures in Parkinson's disease and kinesitherapy<br>• Clinical picture of multiple sclerosis<br>• Physical treatment of patients with MS<br>• Physical treatment of complications in patients with a central lesion nervous system | • Physical treatment of spastic muscles<br>• Physical treatment of patients with multiple sclerosis<br>• Ways of communicating with people with disabilities |

TEACHING UNIT 12 (TWELVTFTH WEEK)

| **REHABILITATION OF PMN LESIONS** | |
|---|---|
| Lectures 2 hours | Exercises 2 hours |
| • Anatomophysiology of motility.<br>• Degrees of peripheral motor neuron lesions<br>• Clinical picture of a patient with a PMN lesion<br>• Diagnosis of PMN lesion<br>• Basic principles of physical therapy<br>• Rehabilitation of patients with peripheral motor neuron lesions by stages.<br><br>**What a student should know:**<br>• Learn and understand the clinical picture of a patient with a PMN lesion<br>• Master the methods of functional evaluation of patients with PMN lesions<br>• Understand the physical therapy of these patients<br>• Learn the principles of kinesitherapy according to the findings of the manual muscle test<br>• Learn and understand electrostimulation of paretic and<br>• paralytic muscles. | • Clinical picture of a patient with a PMN lesion<br>• Electrodiagnosis of PMN lesion<br>• Basic principles of physical therapy<br>• Rehabilitation of patients with peripheral motor neuron lesions by stages.<br><br>**What a student should know:**<br>• Master the methods of functional evaluation of patients with PMN lesions<br>• Master the techniques of applying physical therapy to patients with PMN lesions<br>• Electroanalgesic procedures<br>• Methods of kinesitherapy according to the findings of the manual muscle test<br>• Electrostimulation of paretic and paralytic muscles with exponential currents |

TEACHING UNIT 13 (THIRTEENTH WEEK)

| REHABILITATION IN RHEUMATOLOGY | |
|---|---|
| Lectures 2 hours | Exercises 2 hours |
| • Rehabilitation in rheumatology<br>• Oswestry Index, Composite Function Test<br>• HAQ index.<br><br>**What a student should know:**<br>• Adopt the modern classification of rheumatic diseases.<br>• Master the principles and methods of rehabilitation of patients with inflammatory rheumatism (rheumatoid arthritis, M. Bechterew).<br>• Master the principles and methods of rehabilitation of patients with degenerative rheumatism of peripheral joints (hip, knee) and spinal column (cervical, thoracic and lumbar spine).<br>• Master the principles and methods of rehabilitation of patients with extra-articularrheumatism. | • Diagnostics and clinical specificities of inflammatory, degenerative and extra-articular rheumatism.<br>• Development of a rehabilitation plan for patients with rheumatoid arthritis, M. Bechterew, coxarthrosis, gonarthrosis, spondylosis of the spinal column (cervical and lumbar syndrome), periarthritishumeroscapularis.<br>• Ergonomic counseling and training of patients with rheumatic diseases of the spine.<br><br>**What a student should know:**<br>• Development of a rehabilitation plan for patients with rheumatoid arthritis, Mb Bechterew, coxarthrosis, gonarthrosis, spondylosis of the spinal column (cervical and lumbar syndrome), periarthritis of the humeroscapularwrist<br>• Master measures for ergonomic counseling and training of patients with rheumatic diseases of the spine |

TEACHING UNIT 14 (FOURTEENTH WEEK)

| REHABILITATION IN PULMONOLOGY AND CARDIOLOGY | |
|---|---|
| Lectures 2 hours | Exercises 2 hours |
| • Rehabilitation of pulmonary and cardiac patients<br>• Rehabilitation after acute myocardial infarction<br><br>**What a student should know:**<br>• To adopt the pathological, therapeutic and physiological classification of heart patients.<br>• To learn the clinical assessment of the functional abilities of heart patients.<br>• Learn the importance and impact of physical training (effort) on the cardiovascular system.<br>• Master the principles and methods of rehabilitation of patients with acute myocardial infarction.<br>• Clinical examination and functional evaluation of respiratory patients.<br>• Master the principles and methods of | • Respiratory kinesitherapy, drainage positions.<br>• Kinesitherapy in patients after acute myocardial infarction.<br><br>**What a student should know:**<br>• Master the principles and methods of respiratory kinesitherapy, drainage positions<br>• Master the techniques of functional testing of patients with respiratory disease<br>• Master the principles and techniques of kinesitherapy for patients after acute myocardial infarction<br>• Learn and adopt indications and contraindications for kinesitherapy of patients after acute myocardial infarction |

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| rehabilitation of patients with chronic obstructive lung diseases (bronchial asthma, chronic bronchitis, emphysema). Master the principles and methods of rehabilitation of patients with restrictive lung diseases. Basics of respiratory therapyinfants and young children. | |

TEACHING UNIT 15 (FIFTEENTH WEEK)

| **PEDIATRIC REHABILITATION** | |
|---|---|
| Lectures 2 hours | exercises 1 hour |
| • Cerebral Palsy (CP)<br>• The most common deformities of the spinal column<br>• Scoliosis - classification, diagnosis and therapy<br><br>**What a student should knoww:**<br>• Learn the etiology, pathogenesis, clinical picture, diagnosis of CP<br>• Master the principles of medical habilitation and rehabilitation of CP<br>• Learn physical procedures in CP therapy<br>• Learn the most common spinal deformities<br>• To learn scoliosis - classification, diagnosis and therapy | • Cerebral Palsy (CP)<br>• Scoliosis - classification, diagnosis and therapy<br><br>**What a student should know:**<br>• Master the techniques of clinical diagnosis of a child with CP<br>• Master kinesitherapy techniques and<br>• methods in the treatment of children with CP<br>• Master the techniques of clinical examination of children with scoliosis<br>• Developing a rehabilitation plan for children with scoliosis |

# CLASS SCHEDULE FOR THE SUBJECT PHYSICAL MEDICINE AND REHABILITATION

| Module | Week | Type | Method unit name | A teacher |
|---|---|---|---|---|
| | 1 | L | Thermotherapy | Asst. Prof. Ana Divjak |
| | 1 | E | Thermotherapy | Asst. Prof. Ana Divjak<br>Asst. Prof. Vesna Grbović<br>Dr. Kristijan Krstić |
| | 2 | L | Mechanotherapy. Sonotherapy (infrasound and ultrasound) | Asst. Prof. Ana Divjak |
| | 2 | E | Mechanotherapy. Sonotherapy (infrasound and ultrasound) | Asst. Prof. Ana Divjak<br>Asst. Prof. Vesna Grbović<br>Dr. Kristijan Krstić |
| | 3 | L | Electrotherapy I | Asst. Prof. Vesna Grbović |
| | 3 | E | Electrotherapy I | Asst. Prof. Ana Divjak<br>Asst. Prof. Vesna Grbović<br>Dr. Kristijan Krstić |
| | 4 | L | Electrotherapy II | Asst. Prof. Vesna Grbović |
| | 4 | E | Electrotherapy II | Asst. Prof. Ana Divjak<br>Asst. Prof. Vesna Grbović<br>Dr. Kristijan Krstić |

# CLASS SCHEDULE FOR THE SUBJECT PHYSICAL MEDICINE AND REHABILITATION

| Module | Week | Type | Method unit name | A teacher |
|---|---|---|---|---|
| | | **FT** | **FINAL TEST OF MODULE 1** | |
| **2** | **5** | **L** | Laser therapy. Magnetotherapy | Asst. Prof. Ana Divjak |
| **2** | **5** | **E** | Laser therapy. Magnetotherapy | Asst. Prof. Ana Divjak<br>Asst. Prof. Vesna Grbović<br>Dr. Kristijan Krstić |
| **2** | **6** | **L** | Phototherapy | Asst. Prof. Ana Divjak |
| **2** | **6** | **E** | Phototherapy | Asst. Prof. Ana Divjak<br>Asst. Prof. Vesna Grbović<br>Dr. Kristijan Krstić |
| **2** | **7** | **L** | Hydrotherapy. Balneotherapy | Asst. Prof. Ana Divjak |
| **2** | **7** | **E** | Hydrotherapy. Balneotherapy | Asst. Prof. Ana Divjak<br>Asst. Prof. Vesna Grbović<br>Dr. Kristijan Krstić |
| **2** | **8** | **L** | Kinesitherapy | Asst. Prof. Vesna Grbović |
| **2** | **8** | **E** | Kinesitherapy | Asst. Prof. Ana Divjak<br>Asst. Prof. Vesna Grbović<br>Dr. Kristijan Krstić |
| | | **FT** | **FINAL TEST OF MODULE 2** | |

| Module | Week | Type | Method unit name | A teacher |
|---|---|---|---|---|
| **3** | **9** | **L** | Prosthetics and orthotics | Asst. Prof. Ana Divjak |
| **3** | **9** | **E** | Prosthetics and orthotics | Asst. Prof. Ana Divjak<br>Asst. Prof. Vesna Grbović<br>Dr. Kristijan Krstić |
| **3** | **10** | **L** | Rehabilitation in orthopedics and traumatology | Asst. Prof. Ana Divjak |
| **3** | **10** | **E** | Rehabilitation in orthopedics and traumatology | Asst. Prof. Ana Divjak<br>Asst. Prof. Vesna Grbović<br>Dr. Kristijan Krstić |
| **3** | **11** | **L** | Rehabilitation for CMN lesions | Asst. Prof. Ana Divjak |
| **3** | **11** | **E** | Rehabilitation for CMN lesions | Asst. Prof. Ana Divjak<br>Asst. Prof. Vesna Grbović<br>Dr. Kristijan Krstić |
| **3** | **12** | **L** | Rehabilitation for PMN lesions | Asst. Prof. Vesna Grbović |
| **3** | **12** | **E** | Rehabilitation for PMN lesions | Asst. Prof. Ana Divjak<br>Asst. Prof. Vesna Grbović<br>Dr. Kristijan Krstić |
| **3** | **13** | **L** | Rehabilitation in rheumatology | Asst. Prof. Ana Divjak |
| **3** | **13** | **E** | Rehabilitation in rheumatology | Asst. Prof. Ana Divjak<br>Asst. Prof. Vesna Grbović<br>Dr. Kristijan Krstić |

# CLASS SCHEDULE FOR THE SUBJECT PHYSICAL MEDICINE AND REHABILITATION

| Module | Week | Type | Method unit name | A teacher |
|---|---|---|---|---|
| 3 | 14 | L | Rehabilitation of pulmonology and cardiology patients<br>Rehabilitation after acute myocardial infarction | Asst. Prof. Vesna Grbović |
| 3 | 14 | E | Rehabilitation of pulmonology and cardiology patients<br>Rehabilitation after acute myocardial infarction | Asst. Prof. Ana Divjak<br>Asst. Prof. Vesna Grbović<br>Dr. Kristijan Krstić |
| 3 | 15 | L | Pediatric rehabilitation | Asst. Prof. Ana Divjak |
| 3 | 15 | E | Pediatric rehabilitation | Asst. Prof. Ana Divjak<br>Asst. Prof. Vesna Grbović<br>Dr. Kristijan Krstić |

# CLASS SCHEDULE FOR THE SUBJECT PHYSICAL MEDICINE AND REHABILITATION

| Module | Week | Type | Method unit name | A teacher |
|---|---|---|---|---|
| | | FT | FINAL TEST OF MODULE 3 | |
| | | I | REMEDIAL MODULE, DRAWING OF THE EXAMINATION COMMITTEE (June deadline) | |
| | | I | FINAL SKILLS CHECK AND ORAL EXAM (June deadline) | |

**Commision for taking the final skills and verbal exam**

**Commission1**:

## Questions for the verbal part of the exam in Physical Medicine and Rehabilitation

1. What are the ways of transferring heat to the body? Give examples
2. What is endogenous/exogenous heat? What is dry/moist heat?
3. Paraffinotherapy: mechanism of action, method of application, indications and contraindications
4. Sauna: mechanism of action, method of application, indications and contraindications
5. Cryotherapy: mechanism of action, method of application, indications and contraindications
6. Peloidotherapy: mechanism of action, method of application, indications and contraindications
7. Manual massage:basic terms, physical and physiological action
8. Manual therapeutic techniques (manipulations): mode of action, indications and contraindications
9. Extension procedures (traction): types of extension, indications and contraindications
10. Sonotherapy: physical and physiological effects; indications and contraindications
11. Adverse effects of sonotherapy
12. Dosing of sonotherapy
13. Galvanic current
14. Electrophoresis of drugs
15. Hydrogalvanicbaths
16. Special forms of application of galvanic current
17. Advantages and disadvantages of introducing drugs by electrophoresis
18. Direct impulse currents
19. Exponential currents
20. Modulated currents
21. Diadynamic currents
22. Alternating currents
23. Low-frequency alternating currents
24. Interference currents
25. Transcutaneous Electrical Neural Stimulation (TENS)
26. Short wave diathermy (KTD)
27. Indications and contraindications for high-frequency currents

28. Primary and secondary effects of the electromagnetic field on the organism
29. Magnetotherapy: dosage and application techniques
30. Magnetotherapy: indications and contraindications; advantages and disadvantages
31. Biological effects and therapeutic effects of the biostimulating laser
32. Biostimulating laser: dosage, application techniques, indications and contraindications
33. Infrared radiation: physiological and therapeutic effect
34. Infrared radiation: dosage, application technique, indications and contraindications
35. Definition and procedure for determining biodose
36. Ultraviolet (UV) radiation: biological and physiological effects
37. Ultraviolet (UV) radiation: local, reflex and general reactions
38. Indications and contraindications for the application of ultraviolet (UV) radiation
39. Heliotherapy: physiological effect, dosage, indications and contraindications
40. Hydrotherapy: physical properties
41. Hydrothermal procedures
42. Hydrokinetic procedures
43. Hydrochemical procedures
44. Hydroelectric procedures
45. Mineral waters
46. Juvenile waters
47. Basic characteristics of mineral waters
48. Mineralization
49. Method of application of mineral waters

50. Types of muscle contraction, mode of action
51. Evaluation of locomotor apparatus functions
52. Therapeutic exercises
53. Types of therapeutic exercises
54. Passive exercises
55. Rehabilitation of patients after lower limb amputation in the preoperative phase
56. Rehabilitation of patients after lower limb amputation in the postoperative phase
57. Rehabilitation of patients after lower limb amputation in the pre-prosthetic phase
58. Rehabilitation of patients after lower limb amputation in the post-prosthetic phase
59. Parts of knee prosthesis
60. Orthoses for the spinal column, indications and method of application
61. Soft tissue injuries: physical treatment
62. Contusion of the shoulder joint: mechanism of occurrence, clinical picture and physical treatment
63. Rupture of the Achilles tendon: mechanism of occurrence, clinical picture and physical treatment
64. Distortion of the ankle joint: mechanism of occurrence, clinical picture and physical treatment
65. Complex regional pain syndrome: mechanism of origin, clinical picture and physical treatment
66. Disorders of bone healing: mechanism of occurrence, clinical picture and physical treatment
67. Physical treatment of patients with an artificial hip
68. Central features: clinical picture and physical therapy
69. Medical rehabilitation for craniocerebral injuries in intensive and semi-intensive care units
70. Care measures and limb positioning in hemiplegic patients
71. Rehabilitation of hemiplegics in the flaccid phase
72. Rehabilitation of hemiplegics in the spastic phase
73. Physical therapy consequences and complications of inactivity of the plegic side in hemiplegics
74. Rehabilitation of patients with MorbusParkinsoni
75. Rehabilitation of patients with multiple sclerosis
76. Peripheral nerve damage: clinical picture and physical therapy
77. Kinesitherapy based on assessment by manual muscle test
78. Medical rehabilitation of rheumatoid arthritis
79. Medical rehabilitation of ankylosing spondylitis

80. Medical rehabilitation of coxarthrosis
81. Medical rehabilitation of gonarthrosis
82. Medical rehabilitation of lumbar syndrome
83. Medical rehabilitation of cervical syndrome
84. Phases of rehabilitation after acute myocardial infarction; program "10 steps in 10 days"
85. Contraindications (general and cardiological) for rehabilitation after acute myocardial infarction
86. Clinical assessment of functional capacity of cardiac patients
87. Conditions for starting a rehabilitation program after an acute myocardial infarction and reasons for stopping rehabilitation
88. Airway drainage
89. Reflexive breathing therapy and breathing exercises
90. Respiratory rehabilitation: goals and methods
91. Childhood cerebral palsy (CCP): etiological factors
92. Classification of childhood cerebral palsy (DCO)
93. Examination of a child with cerebral palsy (CCP)
94. Goals and techniques of kinesitherapy in children with cerebral palsy (CCP)
95. The most common deformities of the spinal column
96. Scoliosis
97. Division of scoliosis
98. Diagnostics of scoliosis
99. Clinical signs of scoliosis
100. Scoliosis therapy