

Faculty of Medicine / APPLIED PHYSIOTHERAPY / KINESIOLOGY I

Course:	KINESIOLOGY I			
Course ID	Course status	Semester	ECTS credits	Lessons (Lessons+Exercises+Laboratory)
2004	Mandatory	2	7	3+4+0
Programs	APPLIED PHYSIOTHERAPY			
Prerequisites	There is no requirement to register and listen to the case.			
Aims	Students should gain knowledge of the basic concepts of biomechanics, the characteristics of body movements and the forces acting on the human body as a condition for understanding purposeful movement and its application in therapy.			
Learning outcomes	It is expected that after passing the exam the student will be able to: 1. Define and distinguish the basic terms of biomechanics and kinesiology, describe the main components of kinesiological analysis; 2.Names and describes the types of movement of the human body, estimates the kinematic and kinetic quantities of movement; describes the principles of equilibrium and explains the factors that affect the stability of the body; Describes and explains the role of bone segments, joints, muscles and connective tissue, and the role of central and peripheral nervous system in normal movements and postural adaptation of the human body; 4.Recognizes normal movement and normal motor function of man and explains the difference between normal and pathological movement; 5.Applies biomechanical analysis of movements, uses kinesiological terminology in the presentation of functional analysis of segments of the human body and body as a whole; 6.Demonstrates the performance of basic techniques of musculoskeletal evaluation (anthropometric measurements, goniometry, evaluation of muscle elasticity/length, manual muscle test).			
Lecturer / Teaching assistant	Class teacher Dr sci. med Nikola Bulatović, Expert associate Andrea Vlaović, Mapp physiotherapy			
Methodology	Lectures and exercises. Making homework. Consultations. Learning for practical exercises, colloquiums and final exam.			
Plan and program of work				
Preparing week	Preparation and registration of the semester			
I week lectures	Kinematics. Planar classification of positions and movements (osteokinematics). Rotator and translational motion. Degrees of freedom of movement. Kinematic chains.			
I week exercises	Kinesiology. Kinematics. Osteokinematics. Degrees of freedom of movement. The planes and axes of performing movements. Kinematic chains.			
II week lectures	Goniometry. Determination of the position of the joint. Measurement of the volume of movement.			
II week exercises	Goniometry. Rules for measuring the volume of movements. Determination of the position of the joint.			
III week lectures	Arthrokinetics. The shaft of the wrist. Firm and loose position of the joint. Side moves. Pathology of joint mobility (contracture, ankylosis, irregular postures).			
III week exercises	Arthrokinetics. Determination of the center of the joint shaft. Side moves. Anatomical, firm and loose position of the joint. Pathological positions of the joint.			
IV week lectures	Kinetics. Force. Force vector. Stacking and decomposition of forces. Free body diagram. Levers. Types of levers. Static equilibrium.			
IV week exercises	Kinetics. The fact of force. Levers. Static equilibrium.			
V week lectures	Its a turning point. The efficiency of the force on the leverage. Muscle forces, articular forces, applied weights and resistances.			
V week exercises	Muscle force. Types of muscle contractions. Torque. The force of gravity. Torque and total load.			
VI week lectures	Torque and total load. Manual muscle test.			
VI week exercises	Practical application of torque. Manual muscle test.			
VII week lectures	Weight and center of gravity. Stability and balance. Static and dynamic balance of the body.			
VII week exercises	The center of gravity of the body and the center of gravity. Balance of the body. Static and dynamic equilibrium.			
VIII week lectures	Muscle build. Muscular attachments. Mechanical properties of muscles. Polyarticular muscles. Passive muscle insufficiency. Examination of muscle elasticity. Stretching. The first colloquium.			
VIII week exercises	Structure and function of muscles. The composition of muscle forces. Examination of muscle elasticity and passive insufficiency. Stretching.			

IX week lectures	Excitation of nerve and muscle fibers. Motor unit. Muscle contraction. The theory of muscle contraction. Energetic muscle contractions. Muscle fiber type. The first colloquium.
IX week exercises	The connection between the muscular and nervous systems. Muscle receptors. Neuromuscular transmission. Muscle fibers.
X week lectures	Proprioceptors. Articular receptors. Golgis tendon organ. Muscle spindle. Sensorimotor integration. Kinesthesia and proprioception. Motor control. clinical aspects.
X week exercises	Proprioceptors and their role. Proprioception and kinesthesia testing. Motor control.
XI week lectures	Muscle activity. Types of muscle contractions. Anatomical action of muscles. Passive muscle excursion. Passive muscle insufficiency.
XI week exercises	Muscle as a force. Types of contractions. The composition of muscle forces. The role of muscles.
XII week lectures	Functional division of muscles. Agonists. Antagonists. Synergists. The second colloquium.
XII week exercises	Functional division of muscles. Examples of muscle activity in the open and closed kinetic chain and changing roles.
XIII week lectures	Muscle strength and strength. The length-tension ratio of the muscles. Active muscle insufficiency. Speed of contraction. Measuring muscle strength and strength.
XIII week exercises	Jačina i snaga mišića. Odnos dužina-tenzija mišića. Aktivna insuficijencija mišića. Brzina kontrakcije. Mjerenje jačine i snage mišića.
XIV week lectures	Kinesiology and exercise programs. Types of exercises. Analysis and evaluation of exercises.
XIV week exercises	Types of exercises in kinesitherapy. Assessment of the state and selection of the exercise program.
XV week lectures	Analysis of position and movement. The use of instruments for kinematic and kinetic motion analysis.
XV week exercises	Analiza položaja i pokreta. Upotreba instrumenata za kinematičku i kinetičku analizu pokreta.
Student workload	In the semester Teaching and final exam: $(9.33 \text{ hours}) \times 16 = 149.33 \text{ hours}$ Necessary preparations before the start of the semester (administration, enrollment, certification): $(9.33 \text{ hours}) \times 2 = 18.66 \text{ hours}$ Total load for the subject: $7 \times 30 = 210 \text{ hours}$ Load structure: 149,33 hours (teaching and final exam) + 18.66 hours (preparation) + 42 hours (supplementary thesis)
Per week	Per semester
7 credits x 40/30=9 hours and 20 minuts 3 sat(a) theoretical classes 0 sat(a) practical classes 4 excercises 2 hour(s) i 20 minuts of independent work, including consultations	Classes and final exam: 9 hour(s) i 20 minuts x 16 =149 hour(s) i 20 minuts Necessary preparation before the beginning of the semester (administration, registration, certification): 9 hour(s) i 20 minuts x 2 =18 hour(s) i 40 minuts Total workload for the subject: 7 x 30=210 hour(s) Additional work for exam preparation in the preparing exam period, including taking the remedial exam from 0 to 30 hours (remaining time from the first two items to the total load for the item) 42 hour(s) i 0 minuts Workload structure: 149 hour(s) i 20 minuts (courses), 18 hour(s) i 40 minuts (preparation), 42 hour(s) i 0 minuts (additional work)
Student obligations	Students are required to attend classes, to study for exercises, to do and teach homework, and to do both colloquiums.
Consultations	Consultations as needed in consultation with the teacher and associate.
Literature	S. Sivački: Kinesiology I teaching texts, Faculty of Applied Physiotherapy in Igalo, 2014 N. Hamilton, W. Weimar, K. Luttgens: Kinesiology. Scientific Basis of Human Motion. 12th ed., McGraw-Hill, New York, 2012. L.Smith, E.L.Weiss, L.D.Lehmkuhl: Brunstroms Clinical Kinesiology, 5th ed., F.A.Davis Company, Philadelphia, 1996.
Examination methods	Regular attendance and monitoring of lectures and exercises is evaluated with a total of 5 points; 2 domestic papers are evaluated with a total of points (each work with 2.5 points); 2 colloquiums are evaluated with a total of 40 points (each colloquium with 20 points - 10 points on the practical, 10 points on the theoretical part). The final exam is graded with 50 points (20 points on the practical part of the exam, and 30 on the theoretical part of the exam). A passing score is obtained if you cumulatively collect at least 50 points. The test of knowledge on the practical part of the colloquium and exams is carried out orally, while on the theoretical part of the colloquium and exams is carried out through the test.
Special remarks	There are no special indications.

Comment			There are no special indications.			
Grade:	F	E	D	C	B	A
Number of points	less than 50 points	greater than or equal to 50 points and less than 60 points	greater than or equal to 60 points and less than 70 points	greater than or equal to 70 points and less than 80 points	greater than or equal to 80 points and less than 90 points	greater than or equal to 90 points