	UČNI NAČRT PREDMETA/COURSE SYLLABUS
Predmet Course title	Biomehanska analiza Biomechanical Analysis

Študijski program in stopnja Study programme and level	Študijska smer Study field	Letnik Academic year	Semester Semester
Fizioterapija / 2. stopnja	Ni smeri študija	2. letnik	3.
Physiotherapy / 2nd Cycle	No study field	2nd year	3th

Vrsta predmeta/Course type	izbirni/elective
Univerzitetna koda predmeta/University course code	2_FTH_IP_UN6

Predavanja Lectures	Seminar Seminar	Sem. vaje Tutorial	Lab. vaje Laboratory work	Teren. vaje Field work	Samost. delo Individ. work	ECTS
25		30			155	7

Nosilec predmeta/Lecturer:	izr. prof. dr. Franci Merzel

Jeziki/ Languages:	Predavanja/Lectures:	slovenski/Slovenian
	Vaje/Tutorial:	slovenski/Slovenian

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:	Prerequisites:
• Vpis v drugi letnik študijskega programa. • Študent mora pred izpitom pripraviti in predstaviti ter zagovarjati projektno/raziskovalno nalogo.	• A prerequisite for inclusion is enrolment in the second year of study. • Student has to prepare, present and defend a project/research paper before the exam.

Vsebina:	Content (Syllabus outline):
• *Biomehanski strukturni elementi telesa:* skelet, sklepi, mišice in kite. • *Osnove premikanja:* kinematika, dinamika, težnost, trenje, biomehanske lastnosti mišic, mišično delo, navor. • *Stoja, padanje, drsenje:* ravnovesje, biomehanika stoje, variacija stoje, stabilizacija, biomehanika drsenja, padanja in padcev, varnost pri padcih. • *Hoja in tek:* biomehanika hoje in teka, optimizacija in izboljšanje, varnost. • *Rokovanje z objekti:* biomehanika oprijema, dviganja in prenašanja, varnost.	• *Biomechanical structural elements of the body:* skeleton, ligaments, muscles and tendons. • *Foundations of movement:* kinematics, dynamics, gravity, friction, biomechanical properties of muscles, muscular work, torque. • *Standing, falling, slipping:* balance, biomechanics of standing, variations of standing, enhancement of standing, biomechanics of slipping, falling and landing, safety by falling and landing. • *Walking and running:* biomechanics of walking and running, enhancement and optimization, safety.

• *Skakanje, metanje, udarjanje:* biomehanika pri skoku, metu in udarcu, izboljšanje, varnost. • *Plavanje:* biomehanika plavanja, varnost, učinek pri plavanju.	• *Object manipulation:* biomechanics of gripping, lifting and carrying, safety. • *Jumping, throwing, striking:* biomechanics of the jump, throw and strike, enhancement, safety. • *Swimming:* biomechanics of swimming, safety, efficiency in swimming.

Temeljna literatura in viri/Readings:

Temeljna literatura/Basic literature

- Chapman A. E. (2008). *Biomechanical analysis of fundamental human movements*. Human Kinetics.

Priporočljiva literatura/Recommended literature

- *Bohinc, K. (2016).* Fizika človeškega telesa. Ljubljana: Zdravstvena fakulteta, Univerza v Ljubljani.
- Halliday, D., Resnick, R. in Walker, J. (2013). *Fundamentals of physics.* 6. ed. New York: Wiley and sons. – izbrana poglavja.

Cilji in kompetence:	Objectives and competences:
Učna enota prispeva predvsem k razvoju naslednjih splošnih in specifičnih kompetenc: • celovito kritično mišljenje, sposobnost analize, sinteze in predvidevanje rešitev s področij fizioterapije, izobraževalnih, družboslovnih, humanističnih, organizacijskih, naravoslovno matematičnih ter drugih ved (interdisciplinarnost), • usposobljenost za delovanje v najzahtevnejših okoljih dela v fizioterapiji, sposobnost reševanja kompleksnih problemov, • sposobnost kreativne uporabe znanja v strokovnem/poslovnem okolju, • usposobljenost za kakovostno in varno strokovno delo na področju fizioterapije, • usposobljenost za organizacijo, spremljanje in nadzor dela na področju fizioterapije, • usposobljenost za komuniciranje v domačem in mednarodnem okolju, • avtonomnost pri odločanju in odgovornost za sprejete odločitve, • obvladovanje raziskovalnih metod, postopkov, procesov in tehnologije, • usposobljenost za prepoznavanje potreb po spremembah in uvajanje inovacij v strokovno okolje,	*The learning unit mainly contributes to the development of the following general and specific competences:* • comprehensive critical thinking, ability to analyse, synthesise and predict solutions in the fields of physiotherapy, educational and social sciences, humanities, organiaational sciences, natural sciences, mathematics and other sciences (interdisciplinarity), • the ability to work in the most demanding work environments in physiotherapy, the ability to solve complex problems, • the ability to use knowledge creatively in a professional / business environment, • qualification for high quality and safe professional work in the field of physiotherapy, • the ability to organise, monitor and control work in the field of physiotherapy, • the ability to communicate in the domestic and international environment, • autonomy in decision making and responsibility for decisions taken,

• avtonomnost pri pisanju strokovnih in znanstvenih besedil, • sposobnost za prepoznavanje potreb po spremembah, kritično uvajanje inovacij, obvladovanje sprememb, odločanje in sprejemanje odgovornosti, • ozaveščenost o nujnosti lastnega izpopolnjevanja, dopolnjevanja, poglabljanja in posodabljanja znanja.	• mastery of research methods, procedures, processes and technology, • the ability to identify the need for change and introduce innovation into the professional environment, • autonomy in writing professional and scientific texts, • the ability to identify the need for change, critically innovate, manage change, make decisions and take responsibility, • awareness of the need to improve, supplement, deepen and update knowledge.

Predvideni študijski rezultati:	Intended learning outcomes:
Študent/študentka: • spozna uporabnost kvalitativne in kvantitativne biomehanske analize gibanja, • razume pomen osnovnih principov biomehanike človeškega telesa, • razvije sposobnost za analitično mišljenje in za kvantitativni opis opažanj, • se usposobi za kritično presojo mehanskih vplivov na človeško telo.	*Students:* • know the importance of qualitative and quantitative biomechanical analysis of movements, • recognise the importance of fundamental biomechanical principles of the human body, • develop abilities for analytical thinking and for quantitative description of observations, • develop skills for critical evaluation of mechanically driven effects on human body.

Metode poučevanja in učenja:	Learning and teaching methods:
• *predavanja* z aktivno udeležbo študentov (razlaga, diskusija, vprašanja, primeri, reševanje problemov), • *seminarske vaje:* predstavitev in uspešen zagovor projektne/raziskovalne naloge (reševanje problemov, študije primera, kritično presojanje, diskusija, refleksija izkušenj, vrednotenje, projektno delo, timsko delo).	• *lectures* with active student participation (explanation, discussion, questions, examples, problem solving), • *seminar tutorial:* presentation and successful defence of a project/research paper (problem solving, case studies, methods of critical thinking, discussion, reflection on experience, evaluation, project work, teamwork).

Načini ocenjevanja:	Delež (v %) Weight (in %)	Assessment:
Načini: • izpit • izdelava, predstavitev in zagovor	 50 % 50 %	Types: • exam • preparation, presentation and defence of the project/research paper

projektne/raziskovalne naloge Ocenjevalna lestvica: ECTS.		Grading scheme: ECTS.