

UČNI NAČRT PREDMETA / COURSE SYLLABUS

Predmet: Izbirni predmet : Modeliranje procesov vadbe hitrosti
Course title: Modeling in Speed training Processes

Študijski program in stopnja Study programme and level	Študijska smer Study field	Letnik Academic year	Semester Semester
Doktorski študijski program		1	1 ali 2
Doctoral study program		1	1 or 2

Vrsta predmeta / Course type

Izbirni/elective

Univerzitetna koda predmeta / University course code:

Predavanja Lectures	Seminar Seminar	Vaje Tutorial	Klinične vaje work	Druge oblike študija	Samost. delo Individ. work	ECTS
25	58	10		65		5

Nosilec predmeta / Lecturer:

prof. dr. Milan Čoh

Jeziki /

Predavanja / Lectures: Slovenski/Slovene

Languages:

Vaje / Tutorial:

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:

Izpolnjevanje pogojev za vpis na doktorski študij Kineziologija.

Prerequisites:

General conditions for enrolment into the Doctoral Programme of Kinesiology

Vsebina:

Predmet je razdeljen na naslednje vsebinske sklope:

- Hitrost kot biomotorična sposobnost (motorični vidik, neuralni, fiziološki, biokemični)
- Razvoj hitrosti in biološki razvoj – genetski dejavniki
- Hitrost reakcije, vpliv treninga evociranih možganskih pretokov
- Trening reaktivnosti možganov pri različnih stimulacijah (cold pressor test, ultra zvočna doplerska metoda -TCD)
- Diagnostika hitrosti na osnovi 2 D in 3 D kinematičnih analiz
- Kontrola gibanja s pomočjo pospeškomerov
- Diagnostika hitrosti na osnovi dinamičnih parametrov (paromed, pritiskovne plošče)
- Diagnostika hitrosti z uporabo laserske tehnologije

Content (Syllabus outline):

The course is divided in the following substantive parts:

- Speed as biomotor ability (motor, neural, physiological, biochemical aspects)
- Development of speed and biological development – genetic factors
- Speed of reaction, impact of the training of evoked cerebral blood flows
- Training of cerebral reactivity in different simulations (cold pressor test, transcranial Doppler ultrasound method)
- Speed diagnostics based on 2-D and 3-D kinematic analyses
- Motor control using accelerometers
- Speed diagnostics based on dynamic parameters (paromed, force plates)
- Monitoring of electromyographic (EMG) activity of muscles in the conditions of maximum speed and block acceleration
- Functioning of kinetic muscle chains in sprint in terms of EMG

- Spremljanje elektromiografske EMG aktivnosti mišic v pogojih maksimalne hitrosti in startne akceleracije
- Delovanje kinetičnih mišičnih verig z vidika EMG pri sprintu
- Modeliranje hitrosti s pomočjo GPS tehnologije
- Modeliranje treninga hitrosti s pomočjo integriranih merskih postopkov (kinematika, dinamika, akcelerometrija, EMG, izokinetika)
- Obremenitve mišic pri sprinterskem teku na osnovi termovizije toplotnih polj.
- Aplikacija znanstvenih metod in postopkov v športno prakso.

- Speed modelling using the GPS technology
- Speed training modelling using the integrated measurement procedures (kinematics, dynamics, accelerometry, EMG, isokinetics)
- Muscle loading in sprint running based on thermovision of temperature fields
- Application of scientific methods and procedures in sport practice.

Temeljni literatura in viri / Readings:

- Morrow J.: Measurement and valuation in Human Performance, Human Kinetics, Champaign, IL, 2005.
- Zatsiorsky V.: Biomechanics in Sport, Blackwell Science, 2000.
- Robertson D., Caldwell G., Hamill V., Kamen G., Whittlesey S.: Research Methods in Biomechanics. Human Kinetics, Champaign, IL, 2004
- Tomažin K.: Povezanost morfoloških in motoričnih spremenljivk z uspešnostjo mladih šprinterov v teku na 60 metrov (magistrska naloga), Fakulteta za šport, 1999.
- Brown, L., Ferrigno, V., Santana J.: Training for Speed, Agility and Quickness. Human Kinetics, Champaign IL, 2000.
- Meinel K., Schnabel G.: Bewegungs Sport Lehre Motorik. Sudwest Verlag, 2004.
- Weineck, J.: Optimales Training. Spitta Verlag GmbH & Co, 2008
- Čoh M., Jošt B.: Biomechanical characteristics of technique in certain cosen sports. Ljubljana, Fakulteta za šport, Inštitut za kineziologijo, 2000.
- Čoh, M. *Biomehanika atletike*. Ljubljana: Fakulteta za šport, 2001. 251 str., ilustr., graf. prikazi.
- Škof B. in sod.: Šport po meri otrok in mladostnikov – Pedagoško-psihološki in biološki vidiki kondicijske vadbe mladih, Fakulteta za šport, Univerza v Ljubljani, 2007.
- Bompa T.: Periodization – Theory and Methodology of Training. Human Kinetics, Champaign, IL, 1999
- Enoka, R.: Neuromechanical Basic of Kinesiology, Human Kinetics, Champaign, IL, 1994

Cilji in kompetence:

Objectives and competences:

<p>Cilji:</p> <ul style="list-style-type: none"> • Študenti bodo dobili specifična, poglobljena znanja na področju razvoja hitrosti, ki ga bodo povezali z znanstveno-raziskovalnim in razvojnim delom, • Seznanili se bodo z sodobnimi diagnostičnimi tehnologijami razvoja hitrosti, • Naučiti študente povezovanja znanstveno raziskovalno delo z prakso, • Razviti komunikacijske sposobnosti študentov z vidika prezentacije rezultatov znanstvenega dela na konferencah, kongresih in okroglih mizah. <p>Specifične kompetence:</p> <ul style="list-style-type: none"> • Sposobnost samostojnega znanstveno-raziskovalnega in razvojnega dela na področju kineziološke znanosti, • Razviti sposobnost pisanja znanstveno raziskovalnih del za mednarodne in domače znanstvene revije, • Razviti kritičen odnos do rezultatov lastnega znanstveno raziskovalnega dela, • Razviti sposobnost timskega sodelovanja s strokovnjaki različnih področij, • Obvladati delo z raziskovalnimi tehnologijami. 	<p>Objectives:</p> <ul style="list-style-type: none"> • Students will gain specific, in-depth knowledge in the field of speed development that they will connect with their scientific-research and development work. • They will learn about modern diagnostic technologies of speed development. • They will learn how to connect the scientific-research work with the practice. • Students will develop communication skills in terms of presentation of the results of the scientific work at conferences, congresses and round tables. <p>Specific competences:</p> <ul style="list-style-type: none"> • Ability to independently perform scientific-research and development work in the science of kinesiology. • Develop the ability to write scientific-research papers for international and domestic scientific journals. • Develop a critical attitude to the results of their own scientific-research work. • Develop the ability for team work with experts from various fields. • Gain proficiency in working with research technology. 	
<p>Predvideni študijski rezultati:</p> <ul style="list-style-type: none"> • Znajo smiselno načrtovati in izvesti eksperiment, • Znajo upravljati z raziskovalno tehnologijo, • Znajo oblikovati znanstveni tekst, • Znajo komunicirati z raziskovalci s sorodnih področij. 	<p>Intended learning outcomes:</p> <p>Knowledge and understanding:</p> <ul style="list-style-type: none"> • They learn how to reasonably plan and conduct an experiment. • They learn how to manage the research technology. • They learn how to make a scientific paper. • They learn how to communicate with the researchers from related fields. 	
<p>Metode poučevanja in učenja:</p> <p>Predavanja, seminarji, eksperimentalne vaje, javni kolokviji, laboratorijske meritve, terenske meritve.</p>	<p>Learning and teaching methods:</p> <p>Lectures, experimental exercises, public hearings, laboratory testing, field measurements.</p>	
<p>Načini ocenjevanja:</p> <p>Način (pisni izpit, ustno izpraševanje, naloge, projekt)</p>	<p>Delež (v %) / Weight (in %)</p> <p>100 %</p>	<p>Assessment:</p> <p>Type (examination, oral, coursework, project):</p>

Ustni izpit, uspešno izveden eksperiment, seminar z zagovorom.		Oral examination, successful completion of an experiment, presentation of a seminar.
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Reference nosilca / Lecturer's references:

ČOH, Milan, MACKALA, Krzysztof. Differences between the elite and sub-elite sprinters in kinematic and dynamic determinations of countermovement jump and drop jump. *Journal of strength and conditioning research*, ISSN 1533-4287, nov. 2013, vol. 27, issue 11, str. 3021-3027

ČOH, Milan. *Track and field applied research in sprint and jump*. Saarbrücken: Lambert Academic Publishing, 2014.

ČOH, Milan, TOMAŽIN, Katja, RAUSAVLJEVIĆ, Nikola. Differences in morphological and biodynamic characteristics of maximum speed and acceleration between two groups of female sprinters. *Biol. Sport*, 2007, vol. 24, no. 2, str. 115-128

ČOH, Milan, PEHAREC, Stanislav, BAČIĆ, Petar. The sprint start: Biomechanical analysis of kinematic, dynamic and electromyographic parameters. *New stud. athl.*, 2007, vol. 22, no. 3, str. 29-38

ČOH, Milan, TOMAŽIN, Katja. Biomechanical characteristics of female sprinters during the acceleration phase and maximum speed phase. *Modern athlete and coach*, 2005, vol. 43, no. 4, str. 3-9