| UČNI NAČRT PREDMETA / COURSE SYLLABUS | |
|---|---|
| **Predmet:** | Nevromehanski parktikum |
| **Course title:** | Neuromehanical Practicum |

| Študijski program in stopnja<br>Study programme and level | Študijska smer<br>Study field | Letnik<br>Academic year | Semester<br>Semester |
|---|---|---|---|
| **Kineziologija – doktorski študij** | | **1** | **1 ali 2** |
| **Kinesiology – doctor degree** | | **1st** | **1 st or 2nd** |

| | |
|---|---|
| **Vrsta predmeta / Course type** | Izbirni predmet /Elective course |
| **Univerzitetna koda predmeta / University course code:** | |

| Predavanja<br>Lectures | Seminar<br>Seminar | Vaje<br>Tutorial | Klinične vaje<br>work | Druge oblike študija | Samost. delo<br>Individ. work | ECTS |
|---|---|---|---|---|---|---|
| | **15** | **45** | | **65** | | **5** |

| | |
|---|---|
| **Nosilec predmeta / Lecturer:** | prof. dr. Vojko Strojnik |

| | | |
|---|---|---|
| **Jeziki / Languages:** | **Predavanja / Lectures:** | Slovensko/Slovenian<br>Possible English |
| | **Vaje / Tutorial:** | Slovensko/Slovenian; possible English |

| **Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:** | **Prerequisits:** |
|---|---|
| Izpolnjevanje pogojev za vpis na doktorski študij Kineziologija in poslušanje predmeta Nevromehanika | General conditions for enrolment into the Doctoral Programme of Kinesiology and Listening to Neuromechanics course |

| **Vsebina:** | **Content (Syllabus outline):** |
|---|---|
| • Zajem in analiza EMG signala<br>• Različne vrste hotenega mišičnega naprezanja<br>  o Časovni prostor<br>  o Frekvenčni prostor<br>• Evocirani potenciali<br>  o Miotatični refleks<br>  o Val M<br>  o H refleks<br>• Centralna in periferna utrujenost<br>• Zajem in analiza meritev dinamike<br>  o Kontraktilne lastnosti mišice<br>  o Navor v sklepu<br>  o Tenziometrija<br>• Integracija metod kinematike, dinamike in elektromiografije | • Acquisition and analysis of EMG signals<br>• Different contractions types with voluntary activation<br>  o Time domain analysis<br>  o Frequency domain analysis<br>• Evoked potentials<br>  o Myotatic reflex<br>  o M wave<br>  o H reflex<br>• Central and peripheral fatigue<br>• Acquisition and analysis of dynamic parameters<br>  o Muscle contractile characteristics<br>  o Joint torque<br>  o Ground reaction force<br>• Integration of kinematics, dynamics ans EMG |

**Temeljni literatura in viri / Readings:**

Basmajian, J.V. and De Luca, C.J. (1985) *Muscle alive: their function revealed by electromyography*. 5th edition. Williams & Wilkins, Baltimore.

Merletti R., Parker P.A. (Urednika) (2004) Electromyography- Physiology, Engineering, and Noninvasive Applications. Wiley Interscience.

**Cilji in kompetence:**

- Sposobnost izvajanja laboratorijskih meritev na področju nevromehanike
- Sposobnost analize in predstavitve rezultatov nevromehanskih meritev

**Objectives and competences:**

- Ability to perform measurements in the field of neuromechanics
- Ability to analyze and present data from neuromechanical measurements

**Predvideni študijski rezultati:**

Znanje in razumevanje:
Študenti bodo sposobni samostojno izvesti meritve s področja neuromehanike, analizirati dobljene signale in jih ustrezno predstaviti.

**Intended learning outcomes:**

Knowledge and understanding:
Students will be able to perform measurements in field of neuromechanics, analyze acquired signals and present them properly.

**Metode poučevanja in učenja:**

raziskovalni seminar, laboratorijsko delo

**Learning and teaching methods:**

Research seminar, laboratory work

| **Načini ocenjevanja:** | Delež (v %) / Weight (in %) | **Assessment:** |
|---|---|---|
| Način (pisni izpit, ustno izpraševanje, naloge, projekt) | | Type (examination, oral, coursework, project): |
| seminar | **100%** | Seminar work |

**Reference nosilca / Lecturer's references:**

ŠKOF, Branko, STROJNIK, Vojko. Neuro-muscular fatigue and recovery dynamics following anaerobics interval workload. *Int. j. sports med.*, 2006, vol. 27, 220-225, ilustr. [COBISS.SI-ID 2677425]

TOMAŽIN, Katja, STROJNIK, Vojko, ŠARABON, Nejc. Changes in surface EMG signal under the influence of peripheral fatigue. *European journal of sport science*, 2002, vol. 2: str. 1-9.

JEREB, Blaž, STROJNIK, Vojko. Neuromuscular fatigue after short maximum cycling exercise. *Kinesiology (Zagreb)*. [English ed.], 2003, vol. 35, št. 2, str. 135-142.

TOMAŽIN, Katja, DOLENEC, Aleš, STROJNIK, Vojko. High-frequency fatigue after alpine slalom skiing. *European journal of applied physiology*. [Print ed.], 2008, vol. 103, no. 2, 6 str.

ŠTIRN, Igor, JARM, Tomaž, STROJNIK, Vojko. Repeatability of the mean power frequency of the endurance level. V: JARM, Tomaž (ur.), KRAMAR, Peter (ur.), ŽUPANIČ, Anže (ur.). *11th Mediterranean Conference on Medical and Biological Enginering and Computing 2007, 26-30 June, 2007, Ljubljana, Slovenia*, (IFMBE proceedings, vol. 16). New York: Springer: International Federation for Medical and Biological Engineering, 2007, pDF (4 str.).