UČNI NAČRT PREDMETA/COURSE SYLLABUS

Predmet:	Metode kineziološkega raziskovanja 1
Course title:	Reaserch Metods in Kinesiology 1

Študijski programi in stopnja / Study programme and level	Študijska smer / Study field	Letnik / Academic year	Semester / Semester
Doktorski študijski program / Doctoral study program	Ni členitve (študijski program)	1	1

Univerzitetna koda predmeta/University course code:

Predavanja / Lectures	Seminar / Seminar	Vaje / Tutorial	Klinične vaje / Clinical work	Druge oblike študija / Other study work	Samostojno delo / Individ. work	ECTS
30	15	15		65		**5**

Nosilec predmeta/Lecturer:	Prof. dr. Janez Žibert

Vrsta predmeta/Course type:	obvezni/compulsory

Jeziki/Languages:	Predavanja/Lectures:	Slovenščina in angleščina/Slovene and English
	Vaje/Tutorial:	Slovenščina in angleščina /Slovene and English

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:	Prerequisites:
Izpolnjevanje pogojev za vpis na doktorski študij Kineziologija in absolviran vsaj en dodiplomski predmet iz statistike (z vsaj 4 KT) in en predmet iz metodologije raziskovanja (z vsaj 4 KT).	General conditions for enrolment into the Doctoral Programme of Kinesiology and having passed at least one course on statistics (with at least 4 ECTS credits) and one course on research methodology (with at least 4 ECTS credits) at the undergraduate level.

Vsebina:	Content (Syllabus outline):
I. Raziskovalni proces - formulacija problema - raziskovalni načrt - tipi raziskav - načrtovanje vzorcev - zbiranje podatkov - merjenje ter zanesljivost in veljavnost merjenja	I. Research process - problem formulation - research plan - types of research - sampling - data collection - measurement and its reliability and validity

II. Statistična analiza podatkov: - Opisna statistika in grafična predstavitev podatkov, statistika kontingenčnih tabel - Statistično testiranje hipotez - Določanje velikosti vzorcev - Regresijska analiza: linearni regresijski modeli, logistična regresija - Analiza variance - Faktorska analiza III. Osnovne metode strojnega učenja: - Osnovni principi modeliranja podatkov - Predobdelava podatkov, značilke - Modeli strojnega učenja - Postopki vrednotenja modeliranja	II. Statistical data analysis: – Descriptive statistics and graphical data presentation – Hypothesis testing – Sample size determination – Regression analysis: linear and logistic regression – Analysis of variance – Factor analysis. III. Machine learning: - Basic pricniples of machine learning - Data preprocessinga and features extraction - Machine learning models - Machine learning model evaluation

Temeljna literatura in viri/Readings:

1. Tenenbaum G., M.P. Driscoll: Methods of Research in Sport Sciences. Meyer & Meyer Sport, Oxford, 2005.
2. Newell, J., Aitchison, T., Grant, S. (2014). Statistics for Sports and Exercise Science: A Practical Approach. United Kingdom: Taylor & Francis.
3. A. Field, A. (2009) Discovering Statistics using SPSS, 3rd Edition, SAGE Publications, London.

Cilji in kompetence: **Objectives and competences**:

V tem okviru se želi usposobiti študente: – za izbiro metodološkega pristopa, ki ustreza raziskovalnim ciljem in hipotezam ter drugim okoliščinam, – za razumevanje temeljnih konceptov izbranih statističnih metod in metod strojnega učenja – za samostojno obdelavo podatkov z obravnavanimi metodami na osebnih računalnikih – za pravilno razlago dobljenih rezultatov	Within the above-mentioned framework, train students to: – choose the methodological approach that corresponds to the research objectives, hypotheses and other circumstances, – understand the basic concepts of the selected statistical and machine learning methods – independently process data using the studied methods on a personal computer, – adequately explain the obtained results.

Predvideni študijski rezultati:	Intended learning outcomes:
Znanje in razumevanje: Usposobiti študente za pravilno uporabo metodoloških in statističnih pristopov, ki se uporabljajo v raziskovanju na področju kineziologije.	Knowledge and understanding: Train students to correctly employ methodological and statistical approaches, which are frequently employed in kinesiological research.

Metode poučevanja in učenja:	Learning and teaching methods:
Študentje osvojijo osnovna znanja na predavanjih (v primeru manjšega števila študentov deloma tudi z individualnim študijem pod mentorstvom učitelja). Na vajah si ogledajo konkretne primere in njihovo reševanje s pomočjo programskih orodij (predvidena je uporaba programa SPSS ali podobnih programov). Pridobljeno znanje utrdijo z izdelavo domačih nalog. Podrobneje preučijo dva znanstvena članka s področja teme njihove disertacije in v pisnem poročilu kritično ovrednotijo uporabo raziskovalnih in statističnih metod v člankih.	Students gain basic knowledge of the subject during classes (in case of a smaller number of enrolled students, individual study under the supervision of the lecturer is foreseen). During exercises, concrete cases will be analyzed and solved with adequate statistical software (ie. SPSS). Knowledge gained during courses will be consolidated with homework. Students will be required to analyze two scientific articles from their PhD research and prepare a report focusing on the statistical methods and analyses used in the articles.

Načini ocenjevanja:	Delež/Weight	Assessment:
Način (pisni izpit, ustno izpraševanje, naloge, projekt) Spremlja in ocenjuje se aktivnost študenta na organiziranem delu procesa (predavanje, vaje), izdelava pisnih izdelkov (domače naloge, seminarsko delo), zagovori domačih nalog.	100,00 %	Type (examination, oral, coursework, project): The assessment encompasses the students' class work (during lectures and exercises), their written homework (including project work), and the homework and seminar presentation.

Reference nosilca/Lecturer's references:

1. FOŠNARIČ, Miha, KAMENŠEK, Tina, ŽGANEC GROS, Jerneja, ŽIBERT, Janez (avtor, korespondenčni avtor). Extended compartmental model for modeling COVID-19 epidemic in Slovenia. *Nature - Scientific reports*. 8 Oct. 2022, vol. 12, str. 1-12, ilustr. ISSN 2045-2322. https://www.nature.com/articles/s41598-022-21612-7.pdf, DOI: 10.1038/s41598-022-21612-7.
2. KALIŠNIK, Jurij-Matija, BAUER, André, VOGT, Ferdinand, STICKL, Franziska Josephine, ŽIBERT, Janez, FITTKAU, Matthias, BERTSCH, Thomas, KOUNEV, Samuel, FISCHLEIN, Theodor. Artificial intelligence-based early detection of acute kidney injury after cardiac surgery. *European journal of cardio-thoracic surgery*. [Print ed.]. 2022, vol. 62, iss. 5, ezac289, str. 1-11, ilustr. ISSN 1010-7940. DOI: 10.1093/ejcts/ezac289.
3. KALIŠNIK, Jurij-Matija (avtor, korespondenčni avtor), STEBLOVNIK, Klemen, HROVAT, Eva, JERIN, Aleš, SKITEK, Milan, DINGES, Christian, FISCHLEIN, Theodor, ŽIBERT, Janez. Enhanced detection of cardiac surgery associated acute kidney Injury by composite biomarker panel in patients with normal preoperative kidney function. *Journal of cardiovascular development and disease*. 2022, vol. 9, no. 7, str. 1-10, tabele. ISSN 2308-3425. https://www.mdpi.com/2308-3425/9/7/210, https://repozitorij.uni-lj.si/IzpisGradiva.php?id=137815, DOI: 10.3390/jcdd9070210.
4. KNIFIC, Taja, LAZAREVIČ, Melisa, ŽIBERT, Janez, OBOLNAR, Nika, ALEKSOVSKA, Nataša, ŠUPUT, Jasna, BATTELINO, Tadej, AVBELJ STEFANIJA, Magdalena (avtor, korespondenčni avtor). Final adult height in children with central precocious puberty - a retrospective study. *Frontiers in endocrinology*. Dec. 2022, vol. 13, str. 1-13, ilustr. ISSN 1664-

2392. https://www.frontiersin.org/articles/10.3389/fendo.2022.1008474/full, DOI: 10.3389/fendo.2022.1008474.

5. SHERRATT, Katharine (avtor, korespondenčni avtor), GRUSON, Hugo, GRAH, Rok, JOHNSON, Helen, NIEHUS, Rene, PRASSE, Bastian, SANDMANN, Frank, DEUSCHEL, Jannik, WOLFFRAM, Daniel, ABBOTT, Sam, ŽIBERT, Janez, et al. Predictive performance of multi-model ensemble forecasts of COVID-19 across European nations. *eLife*. 2023, vol. 12, [article no.] e81916, 19 str., ilustr. ISSN 2050-084X. https://elifesciences.org/articles/81916, https://zenodo.org/record/7763308#.ZCKQiS0RrfY, https://repozitorij.uni-lj.si/IzpisGradiva.php?id=146651, DOI: 10.7554/eLife.81916.