



Univerza v Mariboru

Medicinska fakulteta

## UČNI NAČRT PREDMETA / COURSE SYLLABUS

<b>Ime predmeta:</b>	<b>Metode znanstvenoraziskovalnega dela</b>							
<b>Course title:</b>	<b>Scientific Research Methods</b>							
<b>Študijski program in stopnja</b> <b>Study programme and cycle</b>	<b>Študijska smer</b> <b>Study option</b>			<b>Letnik</b> <b>Year of study</b>	<b>Semester</b> <b>Semester</b>			
Biomedicinska tehnologija/3. stopnja				<b>1</b>	<b>1</b>			
Biomedical Technology/3rd Degree								
<b>Vrsta predmeta (obvezni ali izbirni) /</b> <b>Course type (compulsory or elective)</b>				Obvezni				
				Obligatory				
<b>Univerzitetna koda predmeta / University course code:</b>								
<b>Predavanja</b> <b>Lectures</b>	<b>Seminar</b> <b>Seminar</b>	<b>Vaje</b> <b>Tutorial</b>			<b>Klinične vaje</b> <b>Clinical training</b>	<b>Druge oblike študija</b> <b>Other forms of study</b>	<b>Samost. delo</b> <b>Individual work</b>	<b>ECTS</b>
<b>15</b>	<b>15</b>	<b>AV</b>	<b>LV</b>	<b>RV</b>		<b>60</b>		<b>3</b>
<b>Nosilec predmeta / Course coordinator:</b>		Doc. dr. Petra Povalej Bržan, prof. rač. z mat.						
<b>Jeziki /Languages:</b>		<b>Predavanja / Lectures:</b>		Slovenščina/Slovene				
		<b>Vaje / Tutorial:</b>		Slovenščina/Slovene				
<b>Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:</b>				<b>Prerequisites for enrolling in the course or for performing study obligations:</b>				
<b>Vsebina (kratek pregled učnega načrta):</b>				<b>Content (syllabus outline):</b>				
Uvodni del: doktorski študent in mentor, naloge študenta in mentorja, postopek in zahteve za pridobitev doktorata znanosti na UM. Osnovni principi in načela znanstvenoraziskovalnega dela in komuniciranja. Osnovne znanstvene metode: opazovanje in opisovanje, vzrok in posledica, analiza in sinteza, hipoteza, sklepanje, testiranje hipoteze, računalniški modeli in simulacije, iskanje vzročnosti, prevare in zmote. Načrtovanje eksperimentov: primerjalna in absolutna merjenja, izbira vzorcev, ponovljivost, pomembne in nepomembne spremenljivke, naključnost, zaznava robnih primerov, napake, vpliv tehnologije.				Introductory part: doctoral student and mentor, tasks of a student and mentor, procedure and requirements for acquisition of the doctorate of science at the UM. Basic principles and principles of scientific research work and communicating. Basic scientific methods: observation and description, cause and consequence, analysis and synthesis, hypothesis, deduction, testing hypothesis, computer models and simulations, search for causality, fraud and error. Designing experiments: comparative and absolute measurements, selection of samples, repeatability, relevant and irrelevant variables, coincidence, perception of commodity cases, mistakes, influence of technology.				

<p>Sporočanje o znanstvenih rezultatih: osebne komunikacije, tehnična poročila, konferenčni članki, članki v znanstvenih revijah, patenti, disertacije.</p> <p>Znanstveni viri: knjige in članki, znanstvene podatkovne baze in storitve.</p> <p>Kvaliteta objav: JCR, faktor vpliva (IF), objektivna recenzija, kriteriji UM.</p> <p>Etični vidiki raziskovanja: eksperimenti, ki vključujejo ljudi in živali ali njihove podatke, zaščita podatkov.</p> <p>Plagiatorstvo: kaj to je in kako se mu izogniti, citiranje, podvajanje objav.</p> <p>Raziskovalni kodeks: avtorstvo, raziskovalna poštenost.</p> <p>Pisanje članka: struktura članka, jasnost, jedrnatost, pregled stanja, opis lastne metode, predstavitev rezultatov, primerjave, izpostava novosti, zaključki, reference, izbira revije.</p>	<p>Communication on scientific results: personal communications, professional reports, conference articles, articles in scientific journals, patents, dissertations.</p> <p>Scientific sources: books and articles, scientific databases and services.</p> <p>Quality of publications: JCR, impact factor (IF), objective review, criteria of the UM.</p> <p>Ethical aspects of research: experiments which include people and animals or their data, data protection.</p> <p>Plagiarism: what this is and how to avoid it, quotation, publication duplication.</p> <p>Research code: authorship, research integrity.</p> <p>Article writing: article structure, clarity, pithiness, overview, description of one's own method, presentation of results, comparisons, exposure of novelties, conclusions, references, selection of a journal.</p>
<p><b>Temeljna literatura in viri / Reading materials:</b></p>	
<ul style="list-style-type: none"> <li>– P. Dunleavy: <i>Authoring a PhD Thesis: How to Plan, Draft, Write and Finish a Doctoral Thesis</i>, Palgrave MacMillan, Hampshire, 2003;</li> <li>– <i>Critical Thinking in Clinical Research: Applied Theory and Practice Using Case Studies</i>. Editorji: Felipe Fregni in Ben M.W. Illigens, Oxford University Press, Oxford, United Kingdom, 2018.</li> </ul>	
<p><b>Cilji in kompetence:</b></p>	<p><b>Objectives and competences:</b></p>
<p>Cilj predmeta je študente seznaniti s pomenom znanosti in znanstvenoraziskovalnega dela, jih seznaniti z znanstvenimi viri, metodami, postopki objav in pripravo doktorske disertacije.</p>	<p>Objective of the subject is to inform students about the meaning of science and scientific research work, to inform them about scientific sources, methods, procedures of publications and preparation of doctoral dissertation.</p>
<p><b>Predvideni študijski rezultati:</b></p>	<p><b>Intended learning outcomes:</b></p>
<p><b>Znanje in razumevanje:</b></p> <p>Po zaključku predmeta bo študent sposoben:</p> <p>Poznavanja pomena znanstvenoraziskovalnega dela;</p> <p>Poznavanja in razumevanja znanstvenih metod in načrtovanja eksperimentov;</p> <p>Razumevanja pomena skupinskega dela pri znanstvenem razmišljanju;</p> <p>Poznavanja in razumevanja raziskovalne etike;</p> <p>Izkazati znanje in razumevanje potrebno pri oblikovanju doktorske teze.</p>	<p><b>Knowledge and understanding:</b></p> <p>Posterior to the end of the subject a student will be able:</p> <p>To have knowledge of the meaning of scientific research work;</p> <p>To have knowledge and understanding of scientific methods and designing experiments;</p> <p>To have understanding of the meaning of group work in scientific thinking;</p> <p>To have knowledge and understanding of research ethics;</p> <p>To prove knowledge and understanding needed in the formation of a doctoral thesis.</p>
<p><b>Prenosljive/ključne spretnosti in drugi atributi:</b></p> <p>Študent bo po opravljenem predmetu:</p> <p>Sposoben načrtovati, izvesti in poročati o svojem raziskovalnem delu v okviru svoje raziskovalne discipline;</p>	<p><b>Transferable/key competences and other abilities:</b></p> <p>A student will posterior to the completed course:</p> <p>be able to plan, implement and report on his/her research work within his/her research discipline;</p> <p>be able to understand principles and general rules of research work.</p>

Razumel bo načela in splošna pravila raziskovalnega dela.		
<b>Metode poučevanja in učenja:</b>		<b>Learning and teaching methods:</b>
Predavanja Seminarji		Lectures Seminar work
<b>Načini ocenjevanja:</b>	<b>Delež (v %) / Share (in %)</b>	<b>Assessment methods:</b>
Način (pisni izpit, ustno izpraševanje, naloge, projekt)		Method (written or oral exam, coursework, project):
Članek	50 %	Scientific paper
Plakat – predstavitev	50 %	Poster and presentation
Se oceni z opravi/ni opravi		Pass/fail evaluation
<b>Reference nosilca / Course coordinator's references:</b>		
<p>POVALEJ BRŽAN, Petra, OBRADOVIČ, Zoran, ŠTIGLIC, Gregor. Contribution of temporal data to predictive performance in 30-day readmission of morbidly obese patients. PeerJ, ISSN 2167-8359, 2017, vol. 5, no. 3230, str. 1-14, graf. prikazi. <a href="https://peerj.com/articles/3230/">https://peerj.com/articles/3230/</a>, <a href="https://dk.um.si/lzpisGradiva.php?id=67104">https://dk.um.si/lzpisGradiva.php?id=67104</a>, doi: 10.7717/peerj.3230. [COBISS.SI-ID 2321060]</p> <p>POVALEJ BRŽAN, Petra, GALLEGRO, J.A., ROMERO, J. P., GLASER, Vojko, ROCON, E., BENITO-LEÓN, Julián, BERMEJO-PAREJA, Félix, POSADA, Ignacio J., HOLOBAR, Aleš. New perspectives for computer-aided discrimination of Parkinson's disease and essential tremor. Complexity, ISSN 1099-0526. [Online ed.], 2017, vol. 2017, no. 4327175, 1-17 str., ilustr., graf. prikazi. <a href="https://www.hindawi.com/journals/complexity/2017/4327175/">https://www.hindawi.com/journals/complexity/2017/4327175/</a>, <a href="https://dk.um.si/lzpisGradiva.php?id=68863">https://dk.um.si/lzpisGradiva.php?id=68863</a>, doi: 10.1155/2017/4327175. [COBISS.SI-ID 2368420]</p> <p>ŠTIGLIC, Gregor, KOCBEK, Primož, CILAR, Leona, FIJAČKO, Nino, STOŽER, Andraž, ZALETEL, Jelka, SHEIKH, Aziz, POVALEJ BRŽAN, Petra. Development of a screening tool using electronic health records for undiagnosed Type 2 diabetes mellitus and impaired fasting glucose detection in the Slovenian population. Diabetic medicine, ISSN 1464-5491. [Online ed.], 2018, vol. 35, iss. 5, str. 640-649, graf. prikazi, tabele. <a href="https://onlinelibrary.wiley.com/doi/epdf/10.1111/dme.13605">https://onlinelibrary.wiley.com/doi/epdf/10.1111/dme.13605</a>, doi: 10.1111/dme.13605. [COBISS.SI-ID 2392228]</p> <p>POVALEJ BRŽAN, Petra, ROTMAN, Eva, PAJNKIHAR, Majda, KLANJŠEK, Petra. Mobile applications for control and self management of diabetes: a systematic review. Journal of medical systems, ISSN 1573-689X, 2016, vol. 40, no. 9, str. [1-10]. <a href="http://link.springer.com/article/10.1007/s10916-016-0564-8/fulltext.html?wt_mc=alerts.TOCjournals">http://link.springer.com/article/10.1007/s10916-016-0564-8/fulltext.html?wt_mc=alerts.TOCjournals</a>, doi: 10.1007/s10916-016-0564-8. [COBISS.SI-ID 2235044]</p> <p>POVALEJ BRŽAN, Petra, VERLIČ, Mateja, ŠTIGLIC, Gregor. Discovery systems. V: MEYERS, Robert A. (ur.). Encyclopedia of complexity and systems science. New York: Springer. cop. 2009, vol. 2, str. 1982-2002, ilustr. [COBISS.SI-ID 1521572]</p>		