

UČNI NAČRT PREDMETA / COURSE SYLLABUS	
Predmet:	Metode znanstvenoraziskovalnega dela
Course title:	Scientific Research Methods

Študijski program in stopnja Study programme and level	Študijska smer Study field	Letnik Academic year	Semester Semester
BIOMEDICINSKA TEHNOLOGIJA/BIOMEDICAL TECHNOLOGY 3. stopnja/3rd Degree		1	1

Vrsta predmeta / Course type

Obvezni/Compulsory

Univerzitetna koda predmeta / University course code:

Predavanja Lectures	Seminar Seminar	Vaje Tutorial	Klinične vaje work	Druge oblike študija	Samost. Delo Individ. Work	ECTS
15	15				60	3

Nosilec predmeta / Lecturer:

Doc. dr. Petra Povalej Bržan, prof. rač. z mat.

Jeziki /

Predavanja / Lectures:

Slovenščina/Slovene

Languages:

Vaje / Tutorial:

Slovenščina/Slovene

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

Prerequisites:

Vsebina:

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.
Sporočanje o znanstvenih rezultatih: osebne komunikacije, tehnična poročila, konferenčni članki, članki v znanstvenih revijah, patenti, disertacije.
Znanstveni viri: knjige in članki, znanstvene podatkovne baze in storitve.
Kvaliteta objav: JCR, faktor vpliva (IF), objektivna recenzija, kriteriji UM.
Etični vidiki raziskovanja: eksperimenti, ki vključujejo ljudi in živali ali njihove podatke, zaščita podatkov.
Plagiatstvo: kaj to je in kako se mu izogniti, citiranje, podvajanje objav.
Raziskovalni kodeks: avtorstvo, raziskovalna poštenost.
Pisanje članka: struktura članka, jasnost, jedrnatost, pregled stanja, opis lastne metode, predstavitev rezultatov, primerjave, izpostava novosti, zaključki, reference, izbira revije.

Content (Syllabus outline):

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.
Communication on scientific results: personal communications, professional reports, conference articles, articles in scientific journals, patents, dissertations.
Scientific sources: books and articles, scientific databases and services.
Quality of publications: JCR, impact factor (IF), objective review, criteria of the UM.
Ethical aspects of research: experiments which include people and animals or their data, data protection.
Plagiarism: what this is and how to avoid it, quotation, publication duplication.

Research code: authorship, research integrity.

	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.
--	--

Temeljni literatura in viri / Readings:

P. Dunleavy: Authoring a PhD Thesis: How to Plan, Draft, Write and Finish a Doctoral Thesis, Palgrave MacMillan, Hampshire, 2003;
Critical Thinking in Clinical Research: Applied Theory and Practice Using Case Studies. Editorji: Felipe Fregni in Ben M.W. Illigens, Oxford University Press, Oxford, United Kingdom, 2018.

Cilji in kompetence:

Cilj predmeta je študente seznaniti s pomenom znanosti in znanstvenoraziskovalnega dela, jih seznaniti z znanstvenimi viri, metodami, postopki objav in pripravo doktorske disertacije.

Objectives and competences:

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.

Predvideni študijski rezultati:

Intended learning outcomes:

Znanje in razumevanje:

Po zaključku predmeta bo študent sposoben:

- Poznavanja pomena znanstvenoraziskovalnega dela;
- Poznavanja in razumevanja znanstvenih metod in načrtovanja eksperimentov;
- Razumevanja pomena skupinskega dela pri znanstvenem razmišljanju;
- Poznavanja in razumevanja raziskovalne etike;
- Izkazati znanje in razumevanje potrebno pri oblikovanju doktorske teze.

Knowledge and understanding:

Posterior to the end of the subject a student will be able:

- To have knowledge of the meaning of scientific research work;
- To have knowledge and understanding of scientific methods and designing experiments;
- To have understanding of the meaning of group work in scientific thinking;
- To have knowledge and understanding of research ethics;
- To prove knowledge and understanding needed in the formation of a doctoral thesis.

Prenesljive/ključne spretnosti in drugi atributi:

Študent bo po opravljenem predmetu:

- Sposoben načrtovati, izvesti in poročati o svojem raziskovalnem delu v okviru svoje raziskovalne discipline;
- Razumel bo načela in splošna pravila raziskovalnega dela.

Transferable/Key Skills and other attributes:

A student will posterior to the completed course:

- be able to plan, implement and report on his/her research work within his/her research discipline;
- be able to understand principles and general rules of research work.

Metode poučevanja in učenja:

Learning and teaching methods:

Predavanja, seminarji, individualno delo

Lectures, seminar work, individual work

Delež (v %) / Weight (in %) Assessment:		
Načini ocenjevanja:		
članek,	50%	Scientific paper,
plakat – predstavitev	50%	Poster and presentation
Se oceni z opravi/ni opravi		Pass/fail evaluation

Reference nosilca / Lecturer's references:

POVALEJ BRŽAN, Petra, OBRADOVIĆ, 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. <https://peerj.com/articles/3230/>, <https://dk.um.si/IzpisGradiva.php?id=67104>, doi: 10.7717/peerj.3230. [COBISS.SI-ID 2321060]
POVALEJ BRŽAN, Petra, GALLEGU, 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. <https://www.hindawi.com/journals/complexity/2017/4327175/>, <https://dk.um.si/IzpisGradiva.php?id=68863>, doi: 10.1155/2017/4327175. [COBISS.SI-ID 2368420]

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. <https://onlinelibrary.wiley.com/doi/epdf/10.1111/dme.13605>, doi: 10.1111/dme.13605. [COBISS.SI-ID 2392228]

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]. http://link.springer.com/article/10.1007/s10916-016-0564-8/fulltext.html?wt_mc=alerts.TOCjournals, doi: 10.1007/s10916-016-0564-8. [COBISS.SI-ID 2235044]

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]
