

UČNI NAČRT PREDMETA / COURSE SYLLABUS

Predmet:	Znanstvene metode v okoljskih in regionalnih študijah
Course title:	Methodology in Environmental and Regional Studies

Študijski program in stopnja Study programme and level	Študijska smer Study field	Letnik Academic year	Semester Semester
Okoljske in regionalne študije, doktorski študij 3. stopnje	Skupni	1	1., 2.
Environmental and Regional Studies, doctoral study 3rd cycle	Common	1	1, 2

Vrsta predmeta / Course type

Obvezni / Mandatory

Univerzitetna koda predmeta / University course code:

DT001

Predavanja / Lectures	Seminar / Seminar	Vaje / Tutorial	Klinične vaje / Clinical work	Druge oblike študija / Other study forms	Samost. delo / Individual work	ECTS
20	20	10		10	210	9

Nosilec predmeta / Lecturer:

dr. Rok Ciglič,
dr. Filip Küzmič

Jeziki /

Languages:

Predavanja / Lectures:

Vaje / Tutorial:

slovenščina, angleščina / Slovene, English

slovenščina, angleščina / Slovene, English

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

Končana druga bolonjska stopnja ali univerzitetni študij VII stopnje

Prerequisites:

Second-cycle Bologna degree or a university (level VII) degree.

Vsebina:

1. Uvod;
2. Temelji znanstvenega dela:
 - Organiziranost znanosti v Sloveniji ;
 - Spletni informacijski viri (*Web of Science, Google Scholar, Mendeley*);
 - Zasnova znanstvene raziskave;
 - Veljavnost in zanesljivost rezultatov;
 - Pisanje znanstvenih člankov, monografij in disertacije;
 - Etika v znanosti.
3. Pregled kvantitativnih in kvalitativnih metod:
 - Podatki;

Content (Syllabus outline):

1. Introduction
2. Essentials of the research work
 - Organization of science in Slovenia
 - Web information sources (*Web of Science, Google Scholar, Mendeley*)
 - Research methods
 - Validity and reliability of the results
 - Reporting research outcomes: how to write scientific papers, monographs and doctoral thesis
 - Ethical considerations in science
3. Overview of quantitative and qualitative methods

• Izbrane kvantitativne metode v naravoslovju in humanistiki; • Izbrane kvalitativne metode v naravoslovju in humanistiki.	• Types of data • Selected quantitative methods in natural and human sciences • Selected qualitative methods in natural and human sciences
4. Osnove geografskih informacijskih sistemov: • Uvod v geografske informacijske sisteme; • Daljinsko zaznavanje; • Prostorska statistika in pokrajinske mere; • Klasifikacija, podpora odločanju; • Terensko delo in GIS; • Kartografija in spletni GIS-i.	4. Basics of geographical information systems • Introduction into GIS • Remote sensing • Spatial statistics and landscape metrics • Classification, decision support • Field work and GIS • Cartography and web GIS
5. Izbrani podatkovni viri ter programska oprema: • Digitalni viri podatkov; • Arhivski viri; • Programska oprema za analizo pokrajine.	5. Selected sources of data and software • Digital sources of data • Archival sources • Software for landscape research
6. Zasnova in izvedba testov v naravoslovnih znanostih: • Specifike eksperimentalnega načrtovanja v naravoslovnih znanostih; • Napake in etični pomisleki v načrtovanju eksperimentov.	6. Essentials of the method in natural sciences • Specifics of experimental design in natural sciences • Reasoning, confounding factors and specific ethical considerations in natural sciences
7. Osnovni raziskovalni pristopi v raziskavah biodiverzitete, ekologije in evolucije: • predstavitev metod iz študijskih primerov terenskih in laboratorijskih raziskav.	7. The basics of research methodology in biodiversity, ecology and evolution research; • case studies method presentation using field work and laboratory approaches
8. Osnovni raziskovalni pristopi v paleontologiji in sedimentologiji • specifika geoloških znanosti, analitične tehnike v paleontologiji, stratigrafiji in sedimentologiji, • osnovna pravila taksonomske nomenklature, • osnovna pravila stratigrafske nomenklatur.	8. The basics of research methodology in palaeontology and sedimentary geology: • Specific reasoning in Earth Science, Specific analytical techniques in paleontology, stratigraphy and sedimentology, • Basic rules of taxonomic nomenclature, • Basic rules of stratigraphic nomenclature)
9. Osnovni raziskovalni pristopi v krasoslovju: • primeri geološko-geomorfoloških, hidrogeoloških, meteoroloških,	9. The basics of research methodology in karstology: • examples of geological-geomorphological, hydrogeological, meteorological, physical, chemical (laboratory) and geographical (spatial) methods
	10. Laboratory work

fizikalnih, laboratorijsko-kemičnih in prostorsko-geografskih metod). 10. Vaje: • Uvod v uporabo izbranih računalniških programov; • Kritična diskusija o uporabi znanstvenih metod na primeru izbranih objavljenih študij • GIS. 11. Seminar: • Predstavitev izbranih primerov raziskovalnih projektov. 12. Terenske vaje: • Raziskovalno delo na terenu s področja humanistike; • Raziskovalno delo na terenu in v laboratoriju s področja naravoslovja.	• Introduction into selected computer programmes • Critical discussion of the methods used in selected scientific studies • GIS 11. Seminar • Presentation of an example of research project 12. Field work • Research work in the field (human science) • Research work in the field and in the laboratory (natural science)
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Temeljni literatura in viri / Readings:

• Ruxton, G., & Colegrave, N. (2017). Experimental design for the life sciences. Oxford University Press. 4th Edition. Chapters I – VI. • Vrišer, I. 2002: Uvod v geografijo. Ljubljana. Chapters 1, 3, 4 • Guides for researchers. URL: http://www.rgs.org/ (selected websites) • Rogerson, P. 2006: Statistical methods for geography: a student guide. London. Chapters 1,2, 10 • Dillman, D. A., Smyth, J. D., Christian, L. M. 2014: Internet, Phone, Mail, and Mixed Mode Surveys: The Tailored Design Method. Hoboken. Chapters 1, 3 • Burrough, P. A., McDonnell, R. A., Lloyd, C. D. 2015: Principles of geographical information systems. Oxford. Chapters 1–6, 11 • Campbell, J. B. 1996: Introduction to remote sensing. London. Chapters 1, 11, 12 • Brewer, C. A. 2005: Designing better maps. A guide for GIS users. Redlands. Chapters 1–4 Izbrani članki iz znanstvenih revij. / Selected articles from scientific journals. • Ager, D.V. 1993. The nature of the stratigraphic record (3rd edition). Wiley and Sons. • Frodeman R. 1995. Geological reasoning: Geology as an interpretive and historical science. GSA Bulletin 107 (8), 960–968. • Cochran, W., Fenner, P., Hill, M. 1979. Geowriting. A guide to writing, editing, and printing in Earth science (3rd edition). American Geological Institute. (or a later edition of this manual) • Tucker, M. 1988. Techniques in Sedimentology. Blackwell Scientific Publications. • The International Code of Nomenclature for algae, fungi, and plants (ICN, 2012); The International Code of Zoological Nomenclature (ICZN, 4th edition, 1999) (both in free online access). • Salvador, A. (Ed.) 1994. International Stratigraphic Guide. A guide to stratigraphic classification, terminology, and procedure (2nd edition). International Subcommittee on Stratigraphic Classification of IUGS International Commission on Stratigraphy

Cilji in kompetence:

Objectives and competences:

Splošno:

Cilj predmeta je predstaviti načela in metode znanstvenega dela (koraki v raziskavi) od identifikacije/zasnove znanstvenega vprašanja do pisanja znanstvenih publikacij. Predmet bo razložil principe načrtovanja in izvedbe raziskav, vključno s pogostimi napakami in etičnimi pomisleki, predstavil uporabnost kvantitativnih in kvalitativnih metod, metod geografskega informacijskega sistema, zajemanje podatkov, pisanje in vzpostavitev kritičnosti do prebranega gradiva ter pisanje prijav na projekte.

Cilj je tudi predstavitev zasnov raziskav ter njihovo kritično vrednotenje.

Specifično:

Študentke in študenti se bodo na izbranih primerih podrobneje seznanili s tem, kako zasnujemo in izvedemo poskuse v znanosti.

Specifični cilji:

- poznavanje metod raziskovanja v naravoslovju, predvsem metod na področjih biodiverzitete, ekologije in evolucije, paleontologiji in sedimentologiji ter krasoslovju
- poznavanje metod raziskovanja v humanistiki, predvsem na področjih geografije
- poznavanje kvantitativnih in kvalitativnih metod,
- sposobnost snovanja raziskovalnega dela,
- sposobnost samostojnega raziskovalnega dela (s sodobnimi metodami),
- sposobnost predstavljanja znanstvenih rezultatov,
- sposobnost zbiranja različnih vrst gradiv,

Kompetence:

Študentka oz. študent bo imel znanja za samostojno raziskovalno delo.

Predvideni študijski rezultati:

- Poznavanje metod in načel raziskovanja v naravoslovju na področjih biodiverzitete, ekologije in evolucije, paleontologije in sedimentologije ter krasoslovja in humanistiki

General part:

The objective of this course is to help students to embrace the concepts and methods in science from research problem identification to reporting research outcomes. The course will introduce students to the common scientific concepts, to experimental design, data acquisition and statistical analyses. Special emphasis will be laid on scientific ethics. The courses will overview the quantitative and qualitative methods, geographic information systems and data collection. In order to disseminate results effectively, the course will teach scientific dissemination. Our objective is to present selected research studies to students and to teach the student for critical reasoning in science.

Specific part:

Students will learn how to set and realize research.

Specific goals:

- overview of research methods in natural science, in particularly in the fields of biodiversity, ecology and evolution research, palaeontology and sedimentary geology and karstology
- overview of research methods in humanities, particularly in geography
- overview of quantitative and qualitative methods,
- capability of designing research work plan,
- capability of independent research work (with modern methodology),
- capability of presenting research results,
- capability of collecting data and materials.

Competences:

Student will have adequate skills for independent research work.

Intended learning outcomes:

- Knowledge of methods and concepts in natural (biodiversity, ecology and evolution research, palaeontology and sedimentary geology, karstology) and human sciences
- Ability to design sound research work

• Sposobnost zasnove raziskovalnega dela • Praktično poznavanje izbranih računalniških programov za raziskovalno delo • Sposobnost dela z GIS-om • Praktične izkušnje z raziskovalnim delom s širokega področja naravoslovnih in humanističnih znanosti • Sposobnost pisati in kritično uporabljati znanstvene članke	• Basic experiences with software used in research • Ability to use GIS in research • Practical experiences with research work in natural and human sciences • Ability to write and critically review scientific literature
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Metode poučevanja in učenja:

Oblike dela:

- ☒ Frontalna oblika poučevanja
- ☒ Samostojno delo študentov
- ☒ e-izobraževanje

Metode (načini) dela:

- ☒ Razlaga
- ☒ Razgovor/ diskusija/debata
- ☒ Delo z besedilom
- ☒ Proučevanje primera
- ☒ Druge vrste nastopov
- ☒ "Terenske vaje" (npr. obiski podjetij)

Learning and teaching methods:

Types of learning/teaching:

- ☒ Frontal teaching
- ☒ Independent students work
- ☒ e-learning

Teaching methods:

- ☒ Explanation
- ☒ Conversation/discussion/debate
- ☒ Work with texts
- ☒ Case studies
- ☒ Different presentation
- ☒ Field work (e.g. company visits)

Načini ocenjevanja:

Končno ocenjevanje (pisni/ustni izpit)
Drugo – ocene iz vaj

Delež (v %) /
Weight (in %)

80
20

Assessment:

Final examination (written/oral)
Other – Laboratory work

Reference nosilca / Lecturer's references:

- Perko, D. (urednik), Ciglič, R. (urednik), Zorn, M. (urednik) 2020: The geography of Slovenia: small but diverse. World regional geography book series. Cham, Springer Nature. doi: 10.1007/978-3-030-14066-3
- Ciglič, R. (glavni urednik) 2020: Acta geographica Slovenica. Ljubljana, Založba ZRC. url: <https://ojs.zrc-sazu.si/ags/>
- Ciglič, R., Štrumbelj, E., Češnovar, R., Hrvatin, M., Perko, D. 2019: Evaluating existing manually constructed natural landscape classification with a machine learning-based approach. Journal of spatial information science 18. doi: 10.5311/JOSIS.2019.18.464
- Bürger, J., & Küzmič, F. 2023: Vegetation survey methodology in arable weeds is reported with less detail from vegetation science than weed science. Vegetation Classification and Survey, 4, 209–218.
- Bürger, J., Küzmič, F., Šilc, U., Jansen, F., Bergmeier, E., Chytrý, M., Cirujeda, A., Fogliatto, S., Fried, G., Dostatny, D. F., ... & Vidotto, F. 2022: Two sides of one medal: arable weed vegetation of Europe in phytosociological data compared to agronomical weed surveys. Applied Vegetation Science, 25, 1, e12460.

- Küzmič, F., Šilc, U., Lososová, Z., Mucina, L., Chytrý, M., Knollová, I., Hennekens, S. M., Berg, C., Bergmeier, E., Biurrun, I., ... & Tereshenko, S. 2020: European Weed Vegetation Database - a gap-focused vegetation-plot database. *Phytocoenologia*, 50, 1, 93–100