

	UČNI NAČRT PREDMETA/COURSE SYLLABUS
Predmet	Metodologija okoljskih raziskav
Course title	Environmental Research Methodology

Študijski program in stopnja Study programme and level	Študijska smer Study field	Letnik Academic year	Semester Semester
Upravljanje z okoljem/ 2. stopnja	Ni smeri študija	1. letnik	2.
Environmental Management/ 2 nd Cycle	No study field	1 st year	2 nd

Vrsta predmeta/Course type obvezni/obligatory

Univerzitetna koda predmeta/University course code 2_UO_1_UN5

Predavanja Lectures	Seminar Seminar	Sem. vaje Tutorial	Lab. vaje Laboratory work	Teren. vaje Field work	Samost. delo Individ. work	ECTS
45		30			125	8

Nosilec predmeta/Lecturer: doc. dr. Jelena Klisara

Jeziki/ Languages: **Predavanja/Lectures:** slovenski/Slovenian
Vaje/Tutorial: slovenski/Slovenian

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

<ul style="list-style-type: none"> • Vpis v prvi letnik študijskega programa. • Študent mora pred pristopom k izpitu pripraviti in predstaviti raziskovalno nalogo in biti ustrezno prisoten na predavanjih in seminarskih vajah. 	<ul style="list-style-type: none"> • A prerequisite for inclusion is enrolment in the first year of study. • Students must prepare and present a research paper before the examination and be sufficiently present in the lectures and tutorials.
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Vsebina:

Content (Syllabus outline):

<ul style="list-style-type: none"> • <i>Osnovne definicije znanstveno-raziskovalnega dela.</i> • <i>Primerjava raziskovalnih strategij.</i> • <i>Etika in plagiarizem.</i> • <i>Opredelitev raziskovalnih vprašanj in hipotez.</i> • <i>Zanesljivost in veljavnost merjenja.</i> • <i>Načrt in oblikovanje raziskave.</i> • <i>Okoljsko vzorčenje in zbiranja podatkov.</i> 	<ul style="list-style-type: none"> • <i>The main definitions of scientific-research work.</i> • <i>Comparison of research strategies.</i> • <i>Ethics and plagiarism.</i> • <i>Formulation of research questions and hypotheses.</i> • <i>Reliability and validity of measurements.</i> • <i>Proposal development and research design.</i>
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<ul style="list-style-type: none"> • <i>Modeliranje podatkov:</i> Statistični modeli; Diskretne statistične porazdelitve; Zvezne statistične porazdelitve; Linearni regresijski model; Analiza variance; Splošni linearni modeli. • <i>Inferenčna statistika:</i> Ocena parametrov; Testiranje statističnih domnev; Napake tipa I in tipa II, Statistično preverjanje značilnosti. • <i>Analiza časovnih vrst:</i> Komponente časovnih vrst; Preizkusi naključnosti; Odkrivanje sprememb in trendov; Napovedovanje. • <i>Ustvarjanje in pisanje raziskovalnega prispevka:</i> Naslovna stran; Povzetek; Uvod; Metodologija; Rezultati; Diskusija; Reference; Priloge. 	<ul style="list-style-type: none"> • <i>Environmental sampling and data collection.</i> • <i>Data modelling:</i> Statistical models; Discrete statistical distributions; Continuous statistical distributions; Linear regression model; Analysis of variance; Generalized linear models. • <i>Inferential statistics:</i> The estimation of parameters; Testing of statistical hypotheses; Type I and type II errors, Statistical significance testing. • <i>Time series analysis:</i> Components of time series; Tests of randomness; Detection of change points and trends; Forecasting. • <i>Research paper generation and writing:</i> Title page; Abstract; Introduction; Methodology; Results; Discussion; References; Appendices.
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Temeljna literatura in viri/Readings:

Temeljna literatura/Basic literature

- Manly, F. J. B. (2008). *Statistics for Environmental Science and Management* (Second Edition), Chapman & Hall, Boca Raton, Florida.

Priporočljiva literatura/Recommended literature

- Kumar, R. (2019). *Research methodology: a step-by-step guide for beginners*. SAGE, London.
- Barnett, V. (2004). *Environmental Statistics: Methods and Applications*, Chichester, UK: Wiley.
- Chandler, R., and Scott, M., (2011). *Statistical Methods for Trend Detection and Analysis in the Environmental Sciences*, Chichester, UK: Wiley.
- Creswell, J. W. (2014). *Research design: qualitative, quantitative and mixed methods approaches* (Fourth Edition). Thousand Oaks, California, ZDA: Sage Publications, Inc.
- Bell, J. (2010). *Doing Your Research Project: A Guide for First-Time Researchers in Education, Health and Social Science* (Fifth Edition). Open University Press.
- Tominc, P., Čančer V., Rožman, M. (2018), *Metode raziskovanja: Zbirka nalog*, EPF Maribor.
- Adam, F., Hlebec, V., Kavčič, M., Lamut, U., Mrzel, M., Podmenik, D. idr. (2012). *Kvalitativno raziskovanje v interdisciplinarni perspektivi*. Ljubljana: Inštitut za razvojne in strateške analize.
- Izbrani članki iz domačih in tujih znanstvenih revij s področja upravljanja z okoljem.

Cilji in kompetence:

Učna enota prispeva predvsem k razvoju naslednjih splošnih in specifičnih kompetenc:

- celovito kritično mišljenje, sposobnost analize, sinteze in predvidevanja rešitev s področja okoljskih raziskav,
- sposobnost za reševanje okoljskih problemov z uporabo znanstvenih metod in postopkov,
- sposobnost uporabe inferenčne statistike s ciljem sklepanja iz vzorca na populacijo,
- razumevanje časovnih vrst, sposobnost odkrivanja sprememb in trendov ter sposobnost napovedovanja,
- poznavanje standardov in meril za pisanje strokovnih in znanstvenih člankov, prispevkov, raziskovalnih poročil idr.,
- usposobljenost za predstavljanje pridobljenega znanja in raziskovalnih ugotovitev.

Objectives and competences:

The learning unit mainly contributes to the development of the following general and specific competences:

- comprehensive critical thinking, the competence to analyse, synthesize and anticipate solutions in the field of environmental research,
- the ability to solve environmental problems using scientific methods and procedures,
- the ability to apply inferential statistics with the aim of inferring from a sample to the population,
- the understanding of time series, the ability to identify changes and trends, and the ability to make predictions,
- knowledge of standards and criteria for writing professional and scientific research papers, articles, research reports etc.,
- qualifications to represent the acquired knowledge and research results.

Predvideni študijski rezultati:

Študent/študentka razvije:

- sposobnost odkrivanja praktičnih problemov s področja upravljanja z okoljem, ki jih je mogoče reševati z raziskovalnimi metodami in instrumenti,
- zmožnost zastaviti, oblikovati in izvajati obsežen raziskovalni proces na področju upravljanja z okoljem,
- zmožnost javnega predstavljanja in zagovarjanja pridobljenih raziskovalnih rezultatov,
- sposobnost integracije teoretskih spoznanj, raziskovalno-metodološkega znanja in praktičnih izkušenj,
- usposobljenost za raziskovanje.

Intended learning outcomes:

Students develop:

- the ability to identify practical environmental management problems, which can be addressed using research methods and instruments,
- the ability to plan, develop and carry out a comprehensive research process in the field of environmental management,
- the ability to publicly present and defend the research results obtained,
- the ability to integrate theoretical knowledge, research and methodological knowledge with practical experience,
- the competences to carry out research.

Metode poučevanja in učenja:

- *predavanja* z aktivno udeležbo študentov – razlaga, diskusija,

Learning and teaching methods:

- *lectures* with active student participation – explanation, discussion, questions, examples, problem solving,

<p>vprašanja, primeri, reševanje problemov,</p> <ul style="list-style-type: none"> • <i>seminarske vaje</i> z aktivno udeležbo študentov – študentje bodo na konkretnih problemih ponovili in utrdili pojme in metode, spoznane na predavanjih, • <i>kolokviji</i> – z njimi bodo študentje stimulirani, da sproti študirajo obravnavano snov. 	<ul style="list-style-type: none"> • <i>tutorials</i> with active student participation - students practice and review concepts and methods covered in lectures, • <i>midterm examinations</i> – will encourage students to study the material covered in lectures.
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Načini ocenjevanja: Delež (v %) Weight (in %) Assessment:

Načini:	Delež (v %) Weight (in %)	Types:
<ul style="list-style-type: none"> • izpit: študent lahko opravi izpit tudi, če ima oba kolokvija pozitivno ocenjena • raziskovalna naloga: izdelava, predstavitev in zagovor <p>Ocenjevalna lestvica: ECTS.</p>	<p>60 %</p> <p>40 %</p>	<ul style="list-style-type: none"> • examination: students can also pass the exam if both colloquia are positive • research paper: preparation, presentation and defence. <p>Grading scheme: ECTS.</p>