



Univerza v Mariboru

Fakulteta za naravoslovje
in matematiko

UČNI NAČRT PREDMETA / COURSE SYLLABUS

Predmet:	Izbrana poglavja iz biološkega in okoljskega izobraževanja
Course title:	Selected chapters from Biology and Environmental education

Študijski program in stopnja Study programme and level	Študijska smer Study field	Letnik Academic year	Semester Semester
Doktorski študij Ekološke znanosti, 3. stopnja		1. ali 2.; 1st or 2nd	1.- 4.; 1st-4th
Doctoral Study Ecological Sciences, 3rd degree			

Vrsta predmeta / Course type: Izbirni/Elective

Univerzitetna koda predmeta / University course code:

Predavanja Lectures	Seminar Seminar	Vaje Tutorial	Lab. vaje Laboratory work	Terenske vaje Field work	Samost. delo Individ. work	ECTS
4	26				150	6

Nosilec predmeta / Lecturer: prof. dr. Andrej Šorgo

Jeziki / Predavanja / Lectures: slovenščina / Slovene
Languages: Vaje / Tutorial: slovenščina / Slovene

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

Temeljna znanja iz predmetnih didaktik; osnovne spretnosti s področja raziskovalnega dela na področju izobraževanja

Prerequisites:

Basic knowledge from subject didactics; basic research skills in the field of education

Vsebina:

Content (Syllabus outline):

Študenti se bodo v sklopu predmeta seznanili s sodobnimi trendi v proučevanju predmetnih didaktik biologije in okoljskega izobraževanja. Predmet predmetnih didaktik, kot raziskovalnih disciplin, je proučevanje vseh vidikov izobraževanja na preseku med splošno didaktiko ter vsebinami poučevanja in učenja. Medtem, ko ima izobraževanje na področju biologije in okolja, številne skupne značilnosti z izobraževanjem drugih, predvsem naravoslovnih vsebinskih področij, pa se od njih tudi zelo razlikuje. Razlike so predvsem posledica kompleksnosti objektov in procesov poučevanja (živo in živa bitja), metod poučevanja (laboratorijsko, eksperimentalno in terensko delo) ter strategij, ki morajo vključevati komponente kot so proučevanje, stališča in čustva. Poučevanje in učenje zato poteka na treh nivojih: a) o objektu ali procesu; b) z objektom ali procesom; in c) za objekt ali proces.

Students will learn about the subject in the context of the current trends in the study of subject didactics of biology and environmental education. Subject of subject didactics as disciplines of research is the study of all aspects of education at the intersection between general didactics and content of teaching and learning. While the teaching of biology and the environment share a number of common features with education of other, especially science content areas, it is also very different. The differences are mainly due to the complexity of the structures and processes of teaching (life and living creatures), teaching methods (laboratory, experimental and field work), and the strategies that should include components such as inquiry, attitudes and emotions. Teaching and learning therefore takes place on three levels: a) about the object or the process; b) with the object or process; and c) for an object or process.

Temeljni literatura in viri / Readings:

Stevenson, R. B., Brody, M., Dillon, J., & Wals, A. E. (Eds.). (2014). *International handbook of research on environmental education*. Routledge.

Dodatna literatura:

Talbot-Smith, M., Abell, S. K., Appleton, K., & Hanuscin, D. L. (Eds.). (2013). *Handbook of research on science education*. Routledge.

Lederman, N. G., & Abell, S. K. (2014). *Handbook of research on science education* (Vol. 2). Routledge.

Lang, V., & Šorgo, A. (2024). Views of students, parents, and teachers on smartphones and tablets in the development of 21st-century skills as a prerequisite for a sustainable future. *Sustainability*, 16(7, [] 3004), 14. <https://doi.org/10.3390/su16073004>

Špernjak, A., Puhmeister Jug, A., & Šorgo, A. (2023). Public opinions and knowledge about microorganisms. *Research in science & technological education*, 41(2), 800–818. doi:10.1080/02635143.2021.1952407

Kletečki, N., Hruševar, D., Mitić, B., & Šorgo, A. (2023). Plants are not boring, school botany is. *Education sciences*, 13(5, [] 489), 13. doi:10.3390/educsci13050489

Cilji in kompetence:

Objectives and competences:

Temeljni cilji predmeta so usposobiti študente za raziskovalno delo, na področjih biološkega in okoljskega izobraževanja v vseh njegovih fazah. Po opravljenem kurzu ter samostojnem delu bo študent usposobljen za:

- prepoznavo in opredelitev večplastnosti procesov naravoslovnega in okoljskega izobraževanja;
- zastavitev in utemeljitev raziskovalnih vprašanj in hipotez;
- utemeljitev ustreznosti izbora metod proučevalnega, projektnega in problemsko zasnovanega pouka.
- uporabo metod za identifikacijo in opredelitev naravne, osebne in družbene dimenzije pouka;
- oblikovanje in ovrednotenje instrumentov, ki merijo različne nivoje kakovosti pouka;
- oblikovanje in ovrednotenje modelov povezav različnih nivojev poučevanja;
- kvantitativno in kvalitativno evalvacijo modelov in rešitev;
- predstavitev raziskovalnega problema in njegovih rešitev javnosti.

Predvideni študijski rezultati:

The main objectives of the course are to enable students for research work in the fields of biological and environmental education in all its stages. After the course as well as an individual work the student will be able to (for):

- identification and definition of the complexity of the processes of science and environmental education;
- identification and argumentation of research questions and hypotheses;
- justification of the appropriateness of the selection of investigative methods in inquiry, project and problem-based learning.
- the use of methods for identification and characterization of natural, personal and social dimensions of teaching;
- design and evaluation instruments that measure different levels of quality in education;
- design and evaluation of models linking the different levels of teaching;
- quantitative and qualitative evaluation of models and solutions;
- presentation of the research problem and its solution to the audience

Intended learning outcomes:

Znanje in razumevanje:

Po končanem kurzu in samostojnem delu bodo študentje pridobili znanja in spretnosti potrebne za samostojno raziskovalno delo na področju biološkega in okoljskega izobraževanja.

Prenesljive/ključne spretnosti in drugi atributi:

- Sposobnost identifikacije, analize, presoje, ovrednotenja in predstavitve izbranega problema.

Metode poučevanja in učenja:

- Predavanja, seminarsko delo, individualne konzultacije

Knowledge and understanding:

After completion of the course and independent work, students will gain the knowledge and skills necessary for independent research work in the field of biological and environmental education

Transferable/Key Skills and other attributes:

- Competence to identify, analyse, evaluate and present of chosen problem.

Learning and teaching methods:

- Lectures, seminaire work, individual consultations

Delež (v %) /

Načini ocenjevanja:**Weight (in %)****Assessment:**

Seminarska naloga	50	Seminar paper
Ustni izpit	50	Oral exam

Reference nosilca / Lecturer's references:

Lang, V., Špernjak, A., & Šorgo, A. (2024). The relationship between the daily use of digital technologies and the reading and information literacy skills of 15-year-old students. *European journal of educational research*, 13(1), 43–54. doi:10.12973/eu-jer.13.1.43

Lang, V., & Šorgo, A. (2024). Motivation to learn biology: adaptation and validation of a science motivation questionnaire with Slovene secondary school students. *International journal of instruction*, 17(3), 137–156. https://www.e-iji.net/dosyalar/iji_2024_3_8.pdf

Lang, V., & Šorgo, A. (2023). Recognition of the perceived benefits of smartphones and tablets and their influence on the quality of learning outcomes by students in lower secondary biology classes. *Applied sciences*, 13(6, [] 3379), 18. <https://dk.um.si/lzpisGradiva.php?id=88133>