



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:**

Izr. prof. dr. Andrej Šorgo

**Jeziki / Predavanja / Lectures:** slovenski / Slovene; angleški / English  
**Languages: Vaje / Tutorial:**

**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:**

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

#### **Cilji in kompetence:**

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

#### **Objectives and competences:**

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

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:**

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

Načini ocenjevanja:	Delež (v %) / Weight (in %)	Assessment:
Seminarsko delo	70	Seminaire work
Zagovor seminarskega dela	30	Defence of seminaire work

**Reference nosilca / Lecturer's references:**

ŠORGO, Andrej, PIPENBAHER, Nataša, ŠIMIĆ ŠAŠIĆ, Slavica, PROKOP, Pavol, KUBIATKO, Milan, GOLOB, Nika, ERDOGAN, Mehmet, TOMAŽIČ, Iztok, BILÉK, Martin, FANČOVIČOVA, Jana, LAMANAUSKAS, Vincentas, USAK, Muhammet. Cross national study on pre-service elementary and science teachers' opinions on science teaching. *Eurasia*, 2015, vol. 11, iss. 4, str. 713-723.  
 ŠORGO, Andrej, BARTOL, Tomaž, DOLNIČAR, Danica, BOH PODGORNIK, Bojana. Attributes of digital natives as predictors of information literacy in higher education. *British journal of*

*educational technology*, 2016, letn. , št. , str. 1-19, ilustr., doi: [10.1111/bjet.12451](https://doi.org/10.1111/bjet.12451).

ŠORGO, Andrej, KAMENŠEK, Asja. Implementation of a curriculum for environmental education as education for sustainable development in Slovenian upper secondary schools. *Energy education science and technology. Part B, Social and educational studies*, 2012, vol. 4, iss. 2, str. 1067-1076.

ŠORGO, Andrej, ŠPERNJAK, Andreja. Practical work in biology, chemistry and physics at lower secondary and general upper secondary schools in Slovenia. *Eurasia*, 2012, vol. 8, no. 1, str. 11-19.

ŠORGO, Andrej, KOCIJANČIČ, Slavko. False reality or hidden messages: reading graphs obtained in computerized biological experiments. *Eurasia*, 2012, vol. 8, no. 2, str. 129-137.