



Univerza v Mariboru

Fakulteta za naravoslovje
in matematiko

UČNI NAČRT PREDMETA / SUBJECT SPECIFICATION

Predmet:	Sodobne metode poučevanja tehnike
Subject Title:	Advance methods for technical/technological education

Študijski program Study programme	Študijska smer Study field	Letnik Year	Semester Semester
Tehnika – področje izobraževanja		1	letni
		ali	
Education in Engineering		2	zimski
		1	Summer
		or	
		2	winter

Univerzitetna koda predmeta / University subject code:

Predavanja Lectures	Seminar Seminar	Sem. vaje Tutorial	Lab. vaje Labor work	Teren. vaje Field work	Samost. Delo Individ. Work	ECTS
10	5				75	3

Nosilec predmeta / Lecturer:

Jeziki / Predavanja / Lecture:
Languages: Vaje / Tutorial:

Pogoji za opravljanje študijskih obveznosti:

Osnovno znanje iz didaktike, pedagogike in psihologije.

Prerequisites:

Basic knowledge from didactics, pedagogy and psychology.

Vsebina:

Predavanja:

Osnovna izhodišča sodobnih poučevalnih metod na področju tehniško-tehnoloških študijev;
Visokošolska didaktika in tehnično/tehnološki študiji;
Sodobne metode tehniških študijev v evropskih kurikulumih;
Sodobni inženirski praktikum - idejna zasnova, makro in mikro priprava, Organizacija praktičnega izobraževanja v delovnih procesih;
Načrtovanje in izvajanje učnega procesa;
Uporaba sodobnih metod in tehnologij pri izvajanju učnega procesa;
Sodobni načini priprave učnih gradiv;

Seminar:

Seminar aplikativno dopolnjuje vsebino predavanj z reševanjem praktičnih problemov iz izobraževalnega procesa v inženirski praksi .

Content (Syllabus outline):

Lectures:

base origin of contemporary methods at technical-technological studies;
High School didactics in face of technical/technological studies;
contemporary methods of trechnical studies in the European Curriculum;
contemporary Engineer practicum - planning of ideas, macro and micro plan;
organize practical education and training in working process;
planning and executing educational and training process;
use of advance methods and technologies for executing educational and training process;
Contemporary methods for preparing learning materials.

Seminar:

The seminar applicatively completes the contents of lectures through the solution of practical problems from educational process in Engineers practice.

Temeljni literatura in viri / Textbooks:

DOLENC, Kosta. Primer kognitivnega učenja s tehnologijo. V: ABERŠEK, Boris (ur.), FLOGIE, Andrej (ur.), ŠVERC, Alenka (ur.). Sodobno kognitivno izobraževanje in transdisciplinarni modeli učenja : pedagoška strategija. Maribor: Fakulteta za naravoslovje in matematiko, 2015, str. 53-66

Aberšek, B. *Didaktika tehniškega izobraževanja med teorijo in prakso*. 1. izd. Ljubljana: Zavod Republike Slovenije za šolstvo, 2012

DOLENC, Kosta. 3D modeliranje in vizualizacija s programom SketchUp. [Limbuš]: Izotech, 2012

DOLENC, Kosta, ABERŠEK, Boris. TECH8 intelligent and adaptive e-learning system : integration into Technology and Science classrooms in lower secondary schools. *Computers & Education*, ISSN 0360-1315. [Print ed.], Mar. 2015, vol. 82, str. 354-365

Cilji:

podati poglobljeno teoretično znanje s področja prepoznavanja osnovnih značilnosti delovne, tehničnega in proizvodno – tehničnega usposabljanja za delo,

ugotoviti mesto inženirske pedagogike v visokošolski didaktiki;

podati sodobne opredelitve konceptov in modelov v inženirski pedagogiki;

prikazati praktično uporabo strategij vzgojno – izobraževalnih strategij pri usposabljanju za delo;

razviti sposobnost za uspešno načrtovanje različnih oblik izobraževanja;

razviti sposobnosti ljudi za samostojno in kompetentno reševanje praktičnih primerov načrtovanja in vrednotenja učinkov izobraževalnega dela.

Predvideni študijski rezultati:Znanje in razumevanje:

poznavanje splošnih kriterijev za načrtovanje delovnih, tehničnih in proizvodno – tehničnih usposabljanj;

poznavanje osnovnih opredelitev, ki se nanašajo na koncepte in modele v inženirski pedagogiki;

razumevanje pomena uporabe in priprave strokovne literature ter sodobnih pripomočkov za učinkovit in kakovosten izobraževalni proces.

Prenesljive/ključne spretnosti in drugi atributi:

načrtovanje, priprava in izvedba različnih oblik usposabljanj;

kombiniranje uporab različnih znanj za praktično načrtovanje strategije izobraževalnega dela;

izdelava celotnega kurikula za določeno usposabljanje.

Metode poučevanja in učenja:

frontalna predavanja,

skupinsko delo;

izdelava seminarske naloge,

diskusije v elektronskem forumu,

e-učenje.

Objectives:

to represent profound theoretical knowledge in the field of recognizing the basic characteristics of working, technical and production – technical education and training for work;

found and located the place of Engineers pedagogy in high school didactics;

to represent modern concept and model definitions of teaching and training in Engineers pedagogy;

to show practical usage of training – educational strategies to qualify someone for work ;

develop capability for successful planning and executing different form of education and training;

to develop the peoples abilities for an independent and competent for solving of practical examples with regard to planning and evaluating the effects of educational work.

Intended learning outcomes:Knowledge and understanding:

knowledge of general criteria for planning the working, technical and production – technical training and education;

knowledge of basic definitions, relating to the concepts and models in Engineers pedagogy;

understanding of the meaning of using and developing professional literature and modern, as well as working teaching aids for a successful and qualitative training and educational process.

Transferable/Key Skills and other attributes:

planning, preparing and executing different forms of education and training;

combined usage of various knowledge for planning practical strategy for training – educational work;

elaboration of complete curriculum for concrete course.

Teaching and learning methods:

frontal lectures,

work in small groups;

seminar work,

discussion in electronic forums,

e-learning.

Načini ocenjevanja:

Način (pisni izpit, ustno izpraševanje, naloge, projekt):

Delež (v %) /
Weight (in %)

Assessment methods:

Type (examination, oral, coursework, project):

diskusije v elektronskem forumu, seminarska naloga, pisni izpit, ustni izpit.	20 % 40 % 20 % 20 %	discussion in electronic forums, seminar works, written examination, oral examination.
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Reference nosilca / Lecturer's references:

- DOLENC, Kosta, ABERŠEK, Boris. TECH8 intelligent and adaptive e-learning system : integration into Technology and Science classrooms in lower secondary schools. *Computers & Education*, ISSN 0360-1315. [Print ed.], Mar. 2015, vol. 82, str. 354-365
- DOLENC, Kosta, ABERŠEK, Boris, KORDIGEL ABERŠEK, Metka. Online functional literacy, intelligent tutoring systems and science education. *Journal of Baltic science education*, ISSN 1648-3898, 2015, vol. 14, no. 2, str. 162-171
- DOLENC, Kosta, PLOJ VIRTIČ, Mateja, ABERŠEK, Boris. Didactic concepts for e-learning. *Journal of Technology and Information Education*, ISSN 1803-6805, 2013, roč. 5, č. 2, str. 36-39
- DOLENC, Kosta, PESEK, Igor, ABERŠEK, Boris. Modular and branched structure of individualized intelligent e-learning materials for science and technology subject course. V: LAMANAUSKAS, Vincentas (ur.). *Science, technology, society and education issues - 2013*, (Problems of education in the 21st century, ISSN 1822-7864, vol. 57
- DOLENC, Kosta, ABERŠEK, Boris. Integration of design, modeling and visualization in slovenian primary education. V: LAMANAUSKAS, Vincentas (ur.). *Philosophy of mind and cognitive modelling in education - 2012*, (Problems of education in the 21st century, ISSN 1822-7864, vol. 46). Siauliai: Scientific Methodological Center Scientia Educologica, 2012, str. 36-42.