



Univerza v Mariboru

Fakulteta za naravoslovje
in matematiko

UČNI NAČRT PREDMETA / SUBJECT SPECIFICATION

Predmet:	Tehniška ustvarjalnost pri pouku in dejavnostih
Subject Title:	Technical creativity by lectures and activities

Študijski program / stopnja Study programme / level	Študijska smer Study field	Letnik Year	Semester Semester
Tehnika – področje izobraževanja / 3. stopnja	/	1	Letni
		ali	
Education in Engineering / level 3	/	2	zimski
		1	Summer
		ali	
		2	winter

Vrsta predmeta / Course type:

Univerzitetna koda predmeta / University course 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 / Languages: **Predavanja / Lecture:**
Vaje / Tutorial:

Pogoji za opravljanje študijskih obveznosti:

Osnovno znanje iz didaktike tehnike, pedagogike in psihologije.

Prerequisites:

Basic knowledge of technique didactics, pedagogy and psychology.

Vsebina:

Predavanja:

Osnovne definicije o ustvarjalnosti kot generičnem bistvu človeka.

Temelji lateralnega razmišljanja in razlike med lateralnim in vertikalnim razmišljanjem.

Temeljne opredelitve o divergentnih in konvergentnih produkcijah, ki se kažejo v procesu in produktu pri tehniki in tehnologiji.

Projektna naloga kot možnost za razvijanje univerzalne in parcialne ustvarjalnosti učencev.

Analiza metod in postopkov za ustvarjalno reševanje tehniških in tehnoloških problemov.

Seminar:

Content (Syllabus outline):

Lectures:

Basic definitions on creativity as generic essence of a human being.

Foundations of lateral thinking and the difference between lateral and vertical thinking.

Basic definitions on divergent and convergent productions, reflected in the process and product in techniques and technology.

Project work as the possibility for developing universal and partial students' gifts / talents.

Analysis of methods and procedures for a creative solution of technical and technological problems.

Seminar:

Seminar aplikativno dopolnjuje vsebino predavanj z reševanjem praktičnih problemov.

The seminar applicatively completes the content of lectures through the solution of practical problems.

Temeljni literatura in viri / Readings:

Edward de Bono. (2006). Lateralno razmišljanje, New Moment, Ljubljana.
Marentič – Požarnik, B. Psihologija učenja in pouka. DZS, Ljubljana 2003.
Kompore, A idr. Psihologija. Spoznavanja in dileme. Ljubljana, DZS, 2001.
Craft, A., Jeffrey, B., Leibling, M. (2001). *Creativity in Education*, Continuum, London.
Cropley, A. J. (2001). *Creativity in Education & Learning: A Guide for Teachers and Educators*, Routledge, London.

Cilji in kompetence:

podati poglobljeno teoretično znanje o bistvu ustvarjalnosti;
podati sodobne opredelitve o divergentnih in konvergentnih produkcijah, ki se izrazijo kot manifestacija ali potencialna možnost;
uporabiti metode za prepoznavanje ustvarjalnega procesa in produkta;
uporaba teoretičnih znanj o ustvarjalnosti;
razviti sposobnosti študentov za samostojno in poglobljeno reševanje praktičnih problemov na področju tehniške ustvarjalnosti.

Objectives and competences:

to represent profound theoretical knowledge on the essence of creativity;
to represent modern definitions on divergent and convergent productions, reflected as manifestation or potential possibility;
to use the method for recognizing the creative process and product;
to use theoretical knowledge on creativity;
to develop the students' abilities for an independent and profound solution of practical problems in the field of technical creativity.

Predvideni študijski rezultati:

Znanje in razumevanje:
poznovanje teoretičnih osnov in zakonitosti o bistvu ustvarjalnosti;
razumevanje sodobnih opredelitev divergentne in konvergentne produkcijah, ki se izrazijo kot manifestacija ali potencialna možnost;
uporaba metod za razvijanje ustvarjalnih tehniških sposobnosti;
prepoznavanje, evidentiranje, razvijanje in evalviranje rezultatov in dosežkov ustvarjalnega procesa;
sposobnost lateralnega razmišljanja;
uporabiti projektno nalogo kot možnost za razvijanje faktorjev divergentne in konvergentne produkcije;

Prenesljive/ključne spretnosti in drugi atributi:
kombinirana uporaba različnih znanj za reševanje praktičnih problemov na področju tehniške ustvarjalnosti;
uporaba projektne naloge za presojanje ustvarjalnega procesa in produkta.

Intended learning outcomes:

Knowledge and understanding:
to know the theoretical bases and legitimacies on the essence of creativity;
to understand modern definitions of divergent and convergent production, reflected as manifestation or potential possibility;
to use the methods for developing creative technical abilities
recognizing, controlling, developing and evaluating the results and achievements of a creative process;
the ability of lateral thinking;
to use the project work as a possibility for developing the factors of divergent and convergent production;

Transferable/Key Skills and other attributes:
combined usage of various knowledge for the solution of practical problems in the field of technical creativity;
to use the project work for the estimation of a creative process and product.

Metode poučevanja in učenja:

frontalna predavanja,
izdelava seminarske naloge.

Teaching and learning methods:

frontal lectures,
seminar work.

Načini ocenjevanja:

Način (pisni izpit, ustno izpraševanje, naloge, projekt):
seminarska naloga,
pisni izpit,
ustni izpit.

Delež (v %) /
Weight (in %)

30 %
30 %
40 %

Assessment methods:

Type (examination, oral, coursework, project):
seminar work,
written examination,
oral examination.

Reference nosilca / Lecturer's references:

PLOJ VIRTič, Mateja, ABERŠEK, Boris, DOLENC, Kosta. The role of education in developing creativity.

Journal of Technology and Information Education, ISSN 1803-6805, 2013, roč. 5, č. 2, str. 134-139.
http://jtie.upol.cz/13_2.htm. [COBISS.SI-ID [20165640](#)]

PLOJ VIRTÍČ, Mateja. *Inovative pedagogy 1:1 in the light of 21st century competencies : 5 hours lectures at the University of Hradec Králové, Faculty of Science, Hradec Králové, Czech Republic, from 1. 9. 2014 till 30. 9. 2014*. 2014. [COBISS.SI-ID [20971272](#)]

ŠORGO, Andrej, PLOJ VIRTÍČ, Mateja. Can we expect to recruit future engineers among pupils who have never repaired a toy?. V: 2nd International Scientific Conference on Philosophy of Mind and Cognitive Modelling in Education, May 26-28, 2014, Maribor, Slovenia. ABERŠEK, Boris (ur.). *PCE 2014 : conference abstract proceedings*. Maribor: Faculty of Natural Sciences and Mathematics, 2014, str. 96-97. [COBISS.SI-ID [20616968](#)]

PLOJ VIRTÍČ, Mateja, ABERŠEK, Boris, DOLENC, Kosta. Gamification of learning : an effective teaching method of a modern school or a fashion fad?. V: Proceedings of the 9th IOSTE Symposium for Central and Eastern Europe, Hradec Králové, IX-2014. *Science and technology education for the 21st century : research and research oriented studies : proceedings of the 9th IOSTE Symposium for Central and Eastern Europe, Hradec Králové, IX-2014*. 1st ed. Hradec Králové: Gaudeamus, 2014, str. 150-159. [COBISS.SI-ID [20831240](#)]