



Univerza v Mariboru

Fakulteta za naravoslovje  
in matematiko

### UČNI NAČRT PREDMETA / SUBJECT SPECIFICATION

<b>Predmet:</b>	Alternativne energije in energetika
<b>Subject Title:</b>	Alternative Energy and Energetic

Študijski program Study programme	Študijska smer Study field	Letnik Year	Semester Semester
Tehnika – področje izobraževanja		2	zimski / poletni
		<i>ali</i>	
Education in Engineering		3	poletni
		2	winter / summer
		<i>or</i>	
		3	summer

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: Slovenščina / Slovene  
Languages: Vaje / Tutorial:

**Pogoji za opravljanje študijskih obveznosti:**

Osnovno znanja o energijah in energetiki

**Prerequisites:**

Basic knowledge of energy and energy production.

**Vsebina:**

Predavanja:

- Konvencionalni in alternativni viri energije;
- Konvencionalne in nekonvencionalne oblike pridobivanja energij;
- Energetika in okolje;
- usklajevanje želja, potreb in možnosti v energetske sektorju;
- Energetika v prihodnosti - scenariji;
- Uporaba sodobnih nano tehnologij na področju energetike,
- Energetika in transport;
- Energetika in planet zemlja.

Seminar:

Seminar aplikativno dopolnjuje vsebino predavanj z reševanjem praktičnih izzivov in problemov.

**Content (Syllabus outline):**

Lectures:

- Traditional and alternative source of energy;
- Traditional and alternative way of energy production;
- Energy and surrounding;
- reconciliation of wish and possibilities at the energetic sector;
- Energy in future - scenarios;
- Use of advance nano technologies at the energetic sector;
- Energy and the transport;
- Energy and the planet Earth.

Seminar:

Seminar work supplements the lectures with the solutions of the practical problems.

**Temeljni literatura in viri / Textbooks:**

Aberšek, B., *Energije in energetika*, Pedagoška fakulteta, Maribor, 1999  
Berinstein, P., *Alterantive Energy: facts, Statistic, and Issue*, Oryx Press, 2007  
Boyle, G., *Renewable Energy*, Oxford University Press, 2004  
Medved, s., Novak, P. *Varstvo okolja in obnovljivi viri energije*, Ljubljana, Fakulteta za strojništvo, 2000

**Cilji:**

podati znanja in informacij o sodobnih obnovljivih virih energije v tehnični praksi ter sodobnih tehnologijah, ki se danes vse pogosteje uporabljajo za pridobivanje in pretvarjanje in shranjevanje energij;

podati poglobljeno teoretično znanje s področja vrednotenja in izbire posameznih energentov in njihovega izkoriščanja;

prikazati praktično uporabo predhodno pridobljenih teoretičnih znanj na praktičnih primerih s posebnim poudarkom na varovanje okolja varnem in varčnem koriščenju energije;

spodbujanje študentov k kreativnemu in samostojnemu razmišljanju in razvijanju sposobnosti za kreativno reševanje inženirskih problemov s področja energetike in ekologije.

**Predvideni študijski rezultati:**Znanje in razumevanje:

poznavanje splošnih napotkov in pravil za izbiro energentov in ustreznih energetskega pretvornikov;

poznavanje načinov za učinkovito načrtovanje energetskega procesa;

poznavanje metod in smernic za tehnološki razvoj energetike;

poznavanje soodvisnosti med proizvodnjo energije in varovanjem okolja;

poznavanje sodobnih računalniških metod za tehnološko načrtovanje energetske proizvodnje;

razumevanje sovisnosti različnih znanj in postopkov ter pomena uporabe strokovne literature in računalniških sistemov za učinkovito reševanje praktičnih problemov.

Prenesljive/ključne spretnosti in drugi atributi:

uporaba informacijske tehnologije: uporaba orodij za izdelavo predstavitev energetskega načrta;

reševanje problemov: ocenjevanje obstoječih in lastnih tehnoloških rešitev;

kombinirana uporaba različnih znanj za reševanje praktičnih problemov;

načrtovanje tehnologije za pridobivanje energij z uporabo sodobnih metod.

**Metode poučevanja in učenja:**

frontalna predavanja,

skupinsko delo;

izdelava seminarske naloge,

diskusije v elektronskem forumu,

e-učenje.

**Načini ocenjevanja:**

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

diskusije v elektronskem forumu,

seminarska naloga,

pisni izpit,

**Objectives:**

To present knowledge and information about new renewable energy sources used in technical praxes as modern technologies, used for production, transformation and accumulation of energies;

to provide detailed theoretical knowledge from area of assessment and selection of different energy sources and their exploatations;

to demonstrate practical use of previously accumulated theoretical knowledge on the practical examples wit specially stress on the ecology and .safe and economical use of energy;

to encourage the students to creative and independent thinking for developing and solving different problems from power supplied and ecology.

**Intended learning outcomes:**Knowledge and understanding:

knowledge of general instructions and rules for selecting enegy sources and suitable power technologies;

knowledges for effective planning of power supplied technologies;

knowledge of methods and guidelines for technological power production development;

knowledge about connection between energy production and environment prevention;

knowledge of advanced computer aided methods for technological planning of the power production;

understanding of relationships between different skills and procedures and importance of professional literature and computer systems for efficient solutions of practical problems.

Transferable/Key Skills and other attributes:

use of information technology: use of tools for creating and designing technological power process;

problem solving: evaluation of existing and proper program solutions;

combined use of different skills for solution of practical problems;

design of technology for production of energy using advanced approaches.

**Teaching and learning methods:**

frontal lectures,

work in small groups;

seminar work,

discussion in electronic forums,

e-learning.

**Assessment methods:**

Delež (v %) /  
Weight (in %)

<u>Način (pisni izpit, ustno izpraševanje, naloge, projekt):</u>	Delež (v %) / Weight (in %)	<u>Type (examination, oral, coursework, project):</u>
diskusije v elektronskem forumu,	20 %	discussion in electronic forums,
seminarska naloga,	40 %	seminar work,
pisni izpit,	20 %	written examination,

ustni izpit.	20 %	oral examination.
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**Reference nosilca / Lecturer's references:**

Polanec, B., Glodež, S., Aberšek, B. Education of proper waste management based on non-formal and informal education, *Problems of education in the 21st century*, vol. 46, 2012, str. 116-122

Aberšek, B., Borstner, B., Bregant, J. *Virtual teacher : cognitive approach to e-learning material*. Newcastle upon tyne: cambridge scholars publishing, 2014

Aberšek, B., Kordigel Aberšek, M. Development of communication training paradigm for engineers. *J. Balt. sci. educ.*, 2010, vol. 9, no. 2, str. 99-108.

Aberšek, B., Flašker, J. Review of experimental models for confirmation of mathematical models of gears. *Key eng. mater.*, 2008, vol. 385-387, 345-348.

Aberšek, B., Mikluš, S. Models for optimization of gantry crane main girder. *Key eng. mater.*, 2007, vols. 348-349, str. 657-660