



Univerza v Mariboru

Fakulteta za naravoslovje
in matematiko

UČNI NAČRT PREDMETA / COURSE SYLLABUS

Predmet:	Sodobne metode konstruiranja
Course title:	Modern methods of engineering design

Študijski program in stopnja Study programme and level	Študijska smer Study field	Letnik Academic year	Semester Semester
Izobraževalna tehnika, enopredmetni študij 2. stopnje		1	zimski
Educational Design, one stream study, 2 nd. degree		1	winter

Vrsta predmeta / Course type

Univerzitetna koda predmeta / University course code:

Predavanja Lectures	Seminar Seminar	Seminarske vaje Tutorial	Lab. Vaje Lab. Work	Druge oblike študija	Samost. delo Individ. work	ECTS
30	15		15		150	7

Nosilec predmeta / Lecturer:

Jeziki / Languages:

Predavanja / Lectures:	slovenski / Slovenian
Vaje / Tutorial:	slovenski / Slovenian

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

Osnovno znanje o gradivih in konstruiranju.

Prerequisites:

Basic knowledge of materials and design.

Vsebina:

Predavanja:

- prostorsko modeliranje;
- sodobna programska oprema za prostorsko modeliranje (prednosti in slabosti posameznih programskih paketov, možnosti prenosa geometrijskih podatkov);
- priprava tehniške dokumentacije na osnovi prostorskega modela;
- sodobni postopki konstruiranja strojnih delov in konstrukcij;

Content (Syllabus outline):

Lectures:

- solid modelling;
- modern software for solid modelling (benefits and weaknesses of singular program packages, possibilities for geometric data transfer);
- preparation of technical documentation on the basis of solid model;
- modern approaches for design of machine parts and structures;

- uporaba standardov s področja konstruiranja;
- praktični primeri.

Vaje in seminar:

- reševanje praktičnih problemov;
- izdelava seminarske naloge.

- the use of standards from the field of design;
- practical examples.

Tutorials and seminar:

- solving of practical problems;
- seminar work.

Temeljni literatura in viri / Readings:

1. Pehan S.: Metodika konstruiranja, FS UM, 2005.
2. Dolšak B. Računalniško modeliranje proizvodov, UM FS, Maribor, 2001.
3. Glodež S., Tehnično risanje, TZS, Ljubljana 2005.
4. Glodež S, Flašker J., Dimenzioniranje na življenjsko dobo, znanstvena monografija, UM, 2006.
5. Solid Works, *User manual* (uporabniški priročnik).

Cilji in kompetence:

- podati poglobljeno znanje s področja modeliranja in konstruiranja;
- spoznati metode in pristope posameznih faz konstruiranja;
- podati sodobne metode dimenzioniranja strojnih delov in konstrukcij;
- podati uporabo standardov pri konstruiranju;
- prikazati praktično uporabo predhodno pridobljenih teoretičnih znanj na praktičnih primerih.

Objectives and competences:

- to provide detailed knowledge of engineering modelling and design;
- to study methods and approaches of all phases of engineering design;
- provide advanced approaches for dimensioning of machine parts and structures;
- to provide the standardised procedures by design;
- to demonstrate practical use of previously accumulated theoretical knowledge on the practical examples.

Predvideni študijski rezultati:

Znanje in razumevanje:

- razumevanje pojmov in principov inženirskega modeliranja in konstruiranja;
- razumevanje metod in pristopov v posameznih fazah konstruiranja;
- razumevanje sodobnih metod dimenzioniranja strojnih delov in konstrukcij;
- razumevanje pomena standardov in standardizacije.

Prenesljive/ključne spretnosti in drugi atributi:

- kombinirana uporaba znanj iz modeliranja in konstruiranja pri reševanju praktičnih problemov;
- razvoj novih idej in izdelkov.

Intended learning outcomes:

Knowledge and Understanding:

- understanding of concept and principles of of engineering modelling and design;
- understanding of methods and approaches of all phases of engineering design;
- understanding of modern approaches for dimensioning of machine parts and structures;
- understanding of standard procedures and standardisation.

Transferable/Key Skills and other attributes:

- combined use of knowledge of modelling and design to solve practical problems;
- development of the new ideas and

		products.
Metode poučevanja in učenja:		Learning and teaching methods:
<ul style="list-style-type: none"> • predavanja; • laboratorijske vaje; • seminar. 		<ul style="list-style-type: none"> • lectures; • laboratory work; • seminar.
	Delež (v %) /	
Načini ocenjevanja:	Weight (in %) /	Assessment:
<ul style="list-style-type: none"> • ustni izpit; • seminarska naloga 	50 % 50 %	<ul style="list-style-type: none"> • oral exam; • seminar work.

Reference nosilca / Lecturer's references:

1. ZAFOSNIK, Boštjan, GLODEŽ, Srečko, ULBIN, Miran, FLAŠKER, Jože. A fracture mechanics model for the analysis of micro-pitting in regard to lubricated rolling-sliding contact problems. *Int. j. fatigue*. [Print ed.], Sep.-Nov. 2007, vol. 29, iss. 9/11, str. 1950-1958. <http://dx.doi.org/10.1016/j.ijfatigue.2006.12.015>. [COBISS.SI-ID 11143958]
JCR IF (2006): 1.02, SE (20/106), engineering, mechanical, x: 0.741, SE (85/175), materials science, multidisciplinary, x: 1.659
2. JEZERNIK, Niko, GLODEŽ, Srečko, VUHERER, Tomaž, ŠPES, Bojan, KRAMBERGER, Janez. The influence of plasma cutting process on the fatigue of high strength steel S960Q. *Key eng. mater.*, 2007, vol. 348/349, str. 669-672. <http://www.scientific.net/0-87849-448-0/669/>. [COBISS.SI-ID 11484438]
3. FAJDIGA, Gorazd, GLODEŽ, Srečko, KRAMAR, Janez. Pitting formation due to surface and subsurface initiated fatigue crack growth in contacting mechanical elements. *Wear*. [Print ed.], Apr. 2007, vol. 262, iss. 9/10, str. 1217-1224. <http://dx.doi.org/10.1016/j.wear.2006.11.016>. [COBISS.SI-ID 11227670]
JCR IF (2006): 1.18, SE (13/106), engineering, mechanical, x: 0.741, SE (74/175), materials science, multidisciplinary, x: 1.659
4. GLODEŽ, Srečko, POTOČNIK, Rok, FLAŠKER, Jože, ZAFOSNIK, Boštjan. Numerical modelling of crack path in the lubricated rolling-sliding contact problems. *Eng. fract. mech.*. [Print ed.], Feb.-Mar. 2008, vol. 75, iss. 3/4, str. 880-891. <http://dx.doi.org/10.1016/j.engfracmech.2007.02.001>. [COBISS.SI-ID 11144470]
JCR IF (2006): 1.39, SE (21/109), mechanics, x: 1.092