

UČNI NAČRT PREDMETA / COURSE SYLLABUS

Predmet: Računalniško podprto prostorsko modeliranje
Course title: Computer-aided 3D Modelling

Študijski program in stopnja Study programme and level	Študijska smer Study field	Letnik Academic year	Semester Semester
Tehnika – področje izobraževanja		1	Letni
		ali	
Education in Engineering		2	zimski
		or	
		1	Summer
		or	
		2	winter

Vrsta predmeta / Course type

izbirni

Univerzitetna koda predmeta / University course code:

Predavanja Lectures	Seminar Seminar	Vaje Tutorial	Klinične vaje work	Druge oblike študija	Samost. delo Individ. work	ECTS
15	10				155	6

Nosilec predmeta / Lecturer:

Srečko Glodež

**Jeziki /
Languages:**

**Predavanja /
Lectures:** Slovenščina / Slovene
Vaje / Tutorial: Slovenščina / Slovene

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

Osnovno poznavanje dela z osebnim računalnikom.

Prerequisites:

Basic ability to work with personal computer.

Vsebina:

Content (Syllabus outline):

Predavanja:

Študenti se seznanijo s sodobno programsko opremo namenjeno računalniškem 3D modeliranju (namen in razlike, uporaba, možnosti izvoza podatkov). Predstavljene so osnovne metode 3D modeliranja – risanje osnovnih geometrijskih in homogenih teles, risanje modelov z raztegovanjem, obračanjem, spreminjanjem robov in površin.

Prikazano je tudi sestavljanje osnovnih 3D modelov in možnosti vizualizacije: realistično upodabljanje in izdelava animacij.

Poudarek je na strategiji modeliranja, ne pa na ukazih in obvladovanju točno določene oz. izbrane programske opreme!

Seminar:

Vsak študent samostojno izdelava in predstavi 3D model in enega izmed načinov vizualizacije modela s predpisano minimalno stopnjo zahtevnosti. Pri tem lahko uporabi kateregakoli od programov za 3D modeliranje, ki so dostopni bodisi na fakulteti, ali pa je zanje možno pridobiti izobraževalne licence za študente.

Lectures:

The students are acquainted with modern software used in computer aided 3D modelling (purpose, differences, possibilities for geometric data transfer). The emphasis is given to the basic 3D modelling techniques – modelling basic geometric and homogeneous bodies, modelling models with extruding, rotating, modification of edges and surfaces of the model.

Assembly of basic 3D models and visualization: realistic rendering and animation production are also presented.

The main point is to understand the modelling strategy, instead of being able to use appointed commercial software!

Seminar:

Each student individually needs to build and present a 3D model and one method of visualization. Minimal requirements for pretentiousness are defined. Any 3D modeller that is available at the faculty or can be obtained by the students for education purposes is allowed to be used for the seminar work.

Temeljni literatura in viri / Readings:

K. Dolenc: 3D modeliranje in vizualizacija s programom SketchUp, Izotech založba, Limbuš, 2012.

B. Erzetič, H. Gabrijelčič, *3D od točke do upodobitve*, Založba Pasadena, Ljubljana, 2009.

S. Glodež. *Tehnično risanje*. 1. natis. Ljubljana: Tehniška založba Slovenije, 2005.

Priročniki za delo z različnimi programi za 3D modeliranje – v tiskani ali elektronski (help) obliki. / User manuals for various geometric modellers – printed or in electronic (help) version.

Cilji in kompetence:

predstaviti osnovne metode 3D modeliranja;
predstaviti uporabnost 3D modeliranja v tehniki na področju izobraževanja;
predstaviti osnovne možnosti vizualizacije z modeli (realistično upodabljanje, izdelava animacij).

Objectives and competences:

to present basic techniques for 3D modelling;
to present the applicability of 3D modelling in engineering in the field of education;
to present elementary possibilities for model visualization, such as realistic rendering and animation production.

Predvideni študijski rezultati:

Znanje in razumevanje:

razumevanje osnovnih pojmov in metod 3D modeliranja;
poznavanje strategije 3D modeliranja.

Intended learning outcomes:

Knowledge and understanding:

understanding basic concepts and 3D modelling techniques;
conception of 3D modelling strategy.

Prenesljive/ključne spretnosti in drugi atributi:
 praktično obvladovanje programske opreme za 3D modeliranje;
 sposobnost samostojne izgradnje računalniških 3D modelov.

Transferable/Key skills and other attributes:
 ability to apply computer software tools for 3D modelling;
 ability to build computer 3D models individually.

Metode poučevanja in učenja:

frontalna predavanja,
 dialog,
 seminarska naloga - model izdelan z enim izmed programov za 3D modeliranje.

Learning and teaching methods:

frontal lectures,
 dialogue,
 seminar work - model made by using one of the 3D modellers.

Delež (v %) /

Načini ocenjevanja:

Weight (in %)

Assessment:

Način (pisni izpit, ustno izpraševanje, naloge, projekt):	Delež (v %) / Weight (in %)	Type (examination, oral, coursework, project):
seminarska naloga (pogoj za pristop k pisnemu izpitu)	50%	seminar work (required before written examination)
pisni izpit	50%	written examination

Reference nosilca / Lecturer's references:

- GLODEŽ, Srečko. *Tehnično risanje*. 1. natis. Ljubljana: Tehniška založba Slovenije, 2005.
- Glodež S., Šori M., Verlak T. A computational model for bending fatigue analyses of sintered gears. *Strojniški vestnik*, 2014, vol. 60, no. 10, str. 649-655.
- ŠAFHALTER, Andrej, GLODEŽ, Srečko, ABERŠEK, Boris, BAKRAČEVIČ VUKMAN, Karin. Developing spatial ability using 3D modeling in lower secondary school, *Problems of education in the 21st century*, vol. 61, 2014, str. 113-120.
- ŠAFHALTER, Andrej, GLODEŽ, Srečko, BAKRAČEVIČ VUKMAN, Karin. Spatial ability, 3D modelling and styles of thinking in relation to brain hemisphere dominance, *Problems of education in the 21st century*, vol. 54, 2013, str. 91-98.
- Glodež S, Potočnik R., Flašker J. Computational model for calculation of static capacity and lifetime of large slewing bearing's raceway. *Mechanism and Machine Theory*, 2012, vol. 47, str 16-30.