

UČNI NAČRT PREDMETA / COURSE SYLLABUS

Predmet:	Virtualni proizvodi in sistemi
Course title:	Virtual Technologies

Študijski program Study programme and level	Študijska smer Study field	Letnik Academic year	Semester Semester
Inženiring in avtomobilska industrija Podiplomski (druga)	Program nima smeri	drugi	letni
Engineering and Automotive Industry Graduate – Master (second)	The program has no study fields	second	summer

Vrsta predmeta / Course type

Izbirni/optional

Univerzitetna koda predmeta / University course code:

MAG_21016

Predavanja Lectures	Seminar Seminar	Sem. vaje Tutorial	Lab. vaje Laboratory work	Teren. vaje Field work	Samost. delo Individ. work	ECTS
45		45			150	8

Nosilec predmeta / Lecturer:

Doc.dr. Gorazd Hren

**Jeziki /
Languages:**

**Predavanja /
Lectures:**

Slovenski /
slovenian

Vaje / Tutorial:

Slovenski / slovenian

Pogoji za vključitev v delo oz. za opravljanje

študijskih obveznosti:

Prerequisites:

• Osnove geometrijskega modeliranja

• Basics of geometry modelling

Vsebina:

Content (Syllabus outline):

<ul style="list-style-type: none"> – Vrste prototipov – Hitra izdelava prototipov – Virtualni prototipi – Tehnologije navidezne in poglobljene in mešane resničnosti (principi delovanja, HW, SW) – Virtualna okolja: vhodne enote: navigacija, sledilne naprave in vmesniki človek-računalnik; izhodne enote: predstavitev 3D modelov, računalniška 	<ul style="list-style-type: none"> – Type of prototypes – Rapid prototype propagation – Virtual prototypes – Virtual, mixed and augmented reality technologies (principles, HW, SW) – – Virtual environments: input units: navigation, tracking devices and human-computer interfaces; output units: the presentation of 3D models, computer
---	--

<p>grafika, zvok.</p> <ul style="list-style-type: none"> – Človeški faktor (vplivi na uporabnika). – Aplikacije in trendi razvoja. 	<p>graphics, sound.</p> <ul style="list-style-type: none"> – Human factors (user impact). – Applications and development trends.
--	--

Temeljni literatura in viri / Readings:

<ul style="list-style-type: none"> – C. K. Chua, K. F. Leong, C. S. Lim: Rapid Prototyping: Principles and Applications, World Scientific Publishing, 2010. – S.M.LaValle: Virtual reality, University of Illinois, 2016 (dosegljivo: http://vr.cs.uiuc.edu/) ☐ M. Mihelj, D. Novak, S. Beguš: Virtual Reality Technology and Applications, Springer, 2014 – http://www.web3d.org/x3d/documentation – Novejši članki v revijah ali spletu (New articles in journals or Web)
--

Priporočljiva literatura / Recommended Textbooks

<ul style="list-style-type: none"> – F. Dai (Editor), Virtual Reality for Industrial Applications (Computer Graphics Systems and Applications) Springer, 1997 – G. C. Burdea, P. Coiffet, »Virtual Reality Technology, 2nd edition« IEEE PRES, 2003

Cilji in kompetence:

<p>Cilji</p> <p>Osnovni cilj je poenostavitev relacije med konstrukterskimi tehnikami in tehnikami evalvacije z uporabo virtualnih prototipov in hitro izdelanih prototipov. Cilj bo dosežen s predstavitvijo posameznega sistema skozi praktične primere.</p> <p>Kompetence</p> <p>Poznavanje in obvladovanje principov navidezne resničnosti. Uporaba računalniških orodij za analizo in simulacijo izdelkov za virtualno evalvacijo. Sposobnost kreiranja integralnega razvoja virtualnega izdelka</p>

Objectives and competences:

<p>Objectives</p> <p>The basic objective is to simplify the relationship between engineering design techniques and evaluation techniques using virtual prototypes and rapid prototypes processes. The objective will be achieved by presenting procedure through practical examples.</p> <p>Competences</p> <p>Knowledge and management principles of virtual reality. Using computer tools for analysis and simulation products for virtual evaluation. Ability to create integrated virtual product development.</p>
--

Predvideni študijski rezultati:

<p>Znanje in razumevanje:</p> <p>Študent/Študentka:</p> <p>Študent bo sposoben načrtovati in izdelati geometrijo zahtevnih komponent in sklopov in izvesti analize funkcionalnosti.</p> <p>Poznavanje tehnologij na področju izdelave</p>

Intended learning outcomes:

<p>Knowledge and understanding:</p> <p>Student:</p> <p>Students will be able to design and build complex geometry components and assemblies and perform functionality analysis.</p> <p>Students will get know-how of the technologies in</p>
--

prototipov in virtualnih okolij. Razvijanje samostojnega dela.	the field of prototyping and virtual environments. Developing individual problem solving.
---	--

Metode poučevanja in učenja:

Learning and teaching methods:

Klasična predavanja, praktični primeri, Praktično delo v računalniški učilnici, predstavitve študentov	Frontal lectures, case studies, Practical work in computer room, students presentation
---	---

Načini ocenjevanja:

**Delež (v %) / Assessment:
Weight (in%)**

– opravljena seminarska naloga	– 50 %	– seminar work (required before examination)
– ustni izpit (kviz)	– 50 %	– oral examination (questionnaire)

Reference nosilca / Lecturer's references:

<ul style="list-style-type: none"> – HREN, Gorazd, JEZERNIK, Anton. <i>Računalniške tehnologije za podporo konstruiranju : CAx in PxB : zbrano gradivo</i>. Maribor: Fakulteta za strojništvo, 2005. 120 str., ilustr. ISBN 86-435-0704-0. http://lates.fs.uni-mb.si/gradivo. [COBISS.SI-ID 54832385] – HREN, Gorazd. Web-based environment for mechanism simulation integrated with CAD system. <i>Engineering with computers</i>, ISSN 0177-0667, 2010, vol. 26, no. 2, str. 137-148, doi: 10.1007/s00366-009-0146-1. [COBISS.SI-ID1024017244], [JCR, SNIP, WoS do 26. 4. 2010: št. citatov (TC): 0, čistih citatov (CI): 0, normirano št. čistih citatov (NC): 0, Scopus do 17. 4. 2013: št. citatov (TC): 1, čistih citatov (CI): 1, normirano št. čistih citatov (NC): 1] ☐ JEZERNIK, Anton, HREN, Gorazd. A solution to integrate computer-aided design (CAD) and virtual reality (VR) databases in design and manufacturing processes. <i>The international journal of advanced manufacturing technology</i>, ISSN 0268-3768, Dec. 2003, vol. 22, no 11/12, str. 768-774. [COBISS.SI-ID 8517398], [JCR, SNIP, WoS do 13. 6. 2015: št. citatov (TC): 14, čistih citatov (CI): 13, normirano št. čistih citatov (NC): 25, Scopus do 13. 5. 2015: št. citatov (TC): 37, čistih citatov (CI): 36, normirano št. čistih citatov (NC): 71] ☐ HREN, Gorazd, PREDIN, Andrej, ŽAGAR, Ivan. Generic model of wind turbine blades = Generični model lopatic vetrne turbine. <i>Journal of energy technology</i>, ISSN 1855-5748. [Tiskana izd.], feb. 2013, vol. 6, iss. 1, str. 61-68, ilustr. http://www.fe.um.si/en/jet.html. [COBISS.SI-ID 1024133468] – GOLOB, Borut, JEZERNIK, Anton, HREN, Gorazd. A feature based approach for conceptual design. V: MARJANOVID, Dorian (ur.). <i>Proceedings of the 7th International Design Conference DESIGN 2002, Cavtat, Dubrovnik, Croatia, May 14-17, 2002</i>. Zagreb: Faculty of Mechanical Engineering and Naval Architecture; Glasgow: The Design Society, cop. 2002, str. 483-488. [COBISS.SI-ID 7112726]
--