



Fakulteta za naravoslovje
in matematiko

UČNI NAČRT PREDMETA / COURSE SYLLABUS

Predmet:	Virtualna orodja za urjenje
Course title:	Virtual practice tools

Študijski program in stopnja Study programme and level	Študijska smer Study field	Letnik Academic year	Semester Semester
Enovit magistrski študijski program druge stopnje Predmetni učitelj	/	4.	7
Five-year master's degree program Subject Teacher	/		

Vrsta predmeta / Course type:

Univerzitetna koda predmeta / University course code:

Predavanja Lectures	Seminar Seminar	Sem. vaje Tutorial	Lab. vaje Laboratory work	Teren. vaje Field work	Samost. delo Individ. work	ECTS
30		2	28		90	5

Nosilec predmeta / Lecturer:

Jeziki / Languages:	Predavanja / Lectures:	slovenščina / Slovenian
	Vaje / Tutorial:	slovenščina / Slovenian

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

Osnovno znanje programiranja, poznavanje multimedijskih oblikovalnih orodij.

Prerequisites:

Basic programming knowledge, knowledge of multimedia design tools.

Vsebina:

- Uvod v virtualna in razširjena okolja ter orodja.
- Sistemske zahteve (multimodalne vhodne/izhodne naprave, sledilni sistemi, interaktivne metode, modeliranje, avtonomni agenti, omrežja).
- Načrtovalni in implementacijski postopki

Content (Syllabus outline):

- Introduction into Virtual Augmented Reality Environment and Tools.
- System Requirements (Multimodal I/O, Tracking Systems, Interaction Techniques, Modelling, Autonomous Agents, Networks).
- Design and Implementation Strategies (Perceptual Illusions, Navigation and

(iluzije, navigacija in iskanje poti, vsebinski razvoj).

- Aplikativna področja (inženirstvo, izobraževanje, medicina, zabava, vizualizacija informacij).
- Analiza, oblikovanje in ocenjevanje orodij za urjenje.
- Uporabniška prijaznost virtualnih okolij (uporabniško usmerjene metode za razvoj virtualnih okolij, ergonomija virtualnih okolij).
- Zdravstveni in varnostni vidiki (kiberbolezen, prilagoditve in socialni vplivi).

Wayfinding, Content Development).

- Application Domains (Engineering, Education, Medical, Entertainment, Information Visualization).
- Analysis, Development and Evaluation of Virtual practice tools.
- Usability of Virtual Environment (Usability Techniques for Virtual Environments Systems, Software and Hardware Ergonomics).
- Health and Safety Issues (Cybersickness, Adaptation and Social Impact).

Temeljna literatura in viri / Readings:

- J. D. Ivory, Virtual Lives : A Reference Handbook, Contemporary World Issues, Santa Barbara, Calif : ABC-CLIO. 2012. eBook.
- B. Furht, Handbook of Augmented Reality, 2011, eBook
- D. Schmalstieg, T. Hollerer, Augmented Reality: Theory and Practice, Addison-Wesley Professional, 2014

Cilji in kompetence:

Predmet o virtualnih in razširjenih orodjih za urjenje je namenjen pridobivanju znanja o virtualnih in razširjenih okoljih in nudi tudi spoznavanje metod o analizi, oblikovanju in ocenjevanju teh okolij. Predstavljene bodo dosedanje izkušnje, systemske zahteve in nekatere aplikativne rešitve na različnih področjih. Predmet omogoča študentom, da bolje določijo in ocenijo načrtovalne in implementacijske zahteve za aplikacije virtualnih okolij in jih pripravi za uporabo virtualnih orodij za urjenje z minimizacijo zdravstvenih in varnostnih vidikov.

Objectives and competences:

The lecture on Virtual and Augmented Reality Practice Tools are intended to get a knowledge of Virtual and Augmented Reality technology and provides analysis, design and evaluation strategies of Virtual Environment. Current efforts, system requirements and some solutions in a number of application domains are reviewed. The course enable students to better specify design and implementation requirements for VE applications and prepare them to use Virtual and Augmented Reality Tools with minimizations of health and safety concerns.

Predvideni študijski rezultati:

Znanje in razumevanje:

Študentje bodo po predavanjih sposobni

- spoznati in definirati virtualna okolja in njihove systemske zahteve,
- razlikovati in analizirati komponente, kot tudi definirati različne tipe virtualnih okolij in orodij za urjenje,

Intended learning outcomes:

Knowledge and Understanding:

On completion of this course the student will be able to

- recognize and define "Virtual Environment" and their system requirements,
- distinguish and analyse components, as well as define different types of Virtual

- razumeti vlogo in pomen uporabniško prijazne analize, razvoja in ocenjevanja virtualnih okolij,
- uporabiti programska orodja za razvoj virtualnih aplikacij,
- organizirati vse potrebne korake za implementacijo uporabniško prijaznih okolij in orodij za urjenje,
- povzeti in dokazovati zdravstvene vidike za virtualna okolja,
- skupinskega dela v virtualnih programskih okoljih.

Prenesljive/ključne spretnosti in drugi atributi:

- *Spretnosti komuniciranja:* pisno izražanje v forumih, seminarskih delih, ustni in pisni zagovor laboratorijskih vaj.
- *Uporaba informacijske tehnologije:* uporaba orodij za programiranje in oblikovanje virtualnih okolij.
- *Reševanje problemov:* ocenjevanje obstoječih in lastnih programskih rešitev.

Environment and Practice Tools,

- comprehend the role and meaning of user friendly analysis, development and evaluation of Virtual Environments,
- use programming tools for development of Virtual Environments applications,
- organize all needed steps for implementation of user friendly Virtual Environments and Practice Tools,
- summarize and argue health and safety issues for Virtual Environments,
- use tools for computer-supported collaborative work.

Transferable/Key Skills and other attributes:

- *Communication skills:* manner at expression in e-forums and seminar works, oral and written lab work defence.
- *Use of information technology:* use of programming and development tools for Virtual Environments.
- *Problem solving:* evaluation of current and self-made software applications.

Metode poučevanja in učenja:

- predavanja,
- seminarske vaje,
- domače naloge,
- projekt,
- laboratorijske vaje.

Learning and teaching methods:

- lectures,
- tutorial,
- homeworks,
- project,
- lab work.

Delež (v %) /
Weight (in %)

Načini ocenjevanja:

- domače naloge,
- laboratorijske vaje,
- projekt,
- 1. vmesni pisni izpit,
- 2. vmesni pisni izpit,
- 3. vmesni pisni izpit,
- ustni izpit.

10%
30%
20%
10%
10%
10%

Assessment:

- homeworks,
- lab work,
- project,
- 1st midterm written exam,
- 2nd midterm written exam,
- 3rd midterm written exam,
- oral examination.

Opomba:

Če študent ni uspešno opravil vseh treh vmesnih izpitov, jih nadomesti s pisnim izpitom v deležu 30 %.

Note:

If a student has not completed all three midterm exams, he replaces them with a written exam in the weight of 30 %.

Reference nosilca / Lecturer's references:

- DEBEVC, Matjaž, STJEPANOVIĆ, Zoran, HOLZINGER, Andreas. Development and evaluation of an e-learning course for deaf and hard of hearing based on the advanced Adapted Pedagogical Index method. *Interactive learning environments*, vol. 22, iss. 1, str. 35-50
- DEBEVC, Matjaž, KOŽUH, Ines, MEIER, Hilmar. A usability requirements analysis for wireless interaction and connectivity for elderly hearing aid users. *Lecture notes in computer science*, vol. 7946, 2013, str. 260-271
- DEBEVC, Matjaž, KOSEC, Primož, HOLZINGER, Andreas. Improving multimodal web accessibility for deaf people : sign language interpreter module. *Multimedia tools and applications*, 2011, vol. 54, no. 1, str. 181-199
- TESSENDORF, Bernd, DEBEVC, Matjaž, DERLETH, Peter, FEILNER, Manuela, GRAVENHORST, Franz, ROGGEN, Daniel, STIEFMEIER, Thomas, TRÖSTER, Gerhard. Design of a multimodal hearing system. *Computer Science and Information Systems*, 2013, vol. 10, no. 1, str. 483-501
- KOŽUH, Ines, JEREMIĆ, Zoran, SARJAŠ, Andrej, LAPUH BELE, Julija, DEVEDŽIĆ, Vladan, DEBEVC, Matjaž. Social presence and interaction in learning environments : the effect on student success. *Journal of educational technology & society*, 2014, str. 1-4