



Univerza v Mariboru

Fakulteta za naravoslovje  
in matematiko

### UČNI NAČRT PREDMETA / SUBJECT SPECIFICATION

<b>Predmet:</b>	Multimedijske tehnologije pri poučevanju tehnike
<b>Subject Title:</b>	Multimedia technologies in education of engineering

Študijski program Study programme	Študijska smer Study field	Letnik Year	Semester Semester
Tehnika – področje izobraževanja		1	letni
		ali	
Education in Engineering		2	zimski
		1	Summer
		or	
		2	winter

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 / Languages: **Predavanja / Lecture:**   
**Vaje / Tutorial:**

#### Pogoji za opravljanje študijskih obveznosti:

#### Prerequisites:

#### Vsebina:

##### Predavanja:

**Slika, zvok in video:** Tehnične lastnosti analognih in digitalnih slikovnih, avdio in video naprav, senzorji (CCD in CMOS), ločljivost, filtri,

**Računalnik:** Sestava sodobnega multimedijskega računalnika, procesorji, pomnilniki, vhodno-izhodne naprave,

**Komunikacije:** Digitalni prenos informacij, računalniške mreže, internetno omrežje, distribucijski sistemi, mrežne usluge, strežniki, odjemalci, aktivne strežniške strani

**Programska oprema:** Obdelava signalov, standardi kodiranja in komprimiranja (slika - raw, bmp, jpg, gif, tiff ...; zvok - wav, mp3; video - mpg, avi, mov ...)

Avtorski sistemi, testni sistemi, programski jeziki

**Informacijski sistemi v izobraževanju:** e-izobraževanje, LMS, e-portfolio, multimedijske zbirke,

#### Content (Syllabus outline):

##### Lectures:

**Image, sound and video:** technical characteristics of analogue and digital devices, sensors (CCD, CMOS), resolution, filters ...

**Computer:** Structure of modern multimedia computer, processors, memory, input and output devices

**Communications:** Digital data transmission, computer networks, internet, distribution systems, network services, servers, clients, active server pages.

**Software:** Digital signal processing, Coding and decoding algorithms, compression, (image - raw, bmp, jpg, gif, tiff ..., sound - wav, mp3, video - mpg, avi, mov ...) Authoring systems, test systems, programming languages.

**Information systems in education:** distance education, LMS, e-portfolios, multimedia databases.

**Vodenje projektov razvoja multimedijjskih učnih gradiv**Seminar:

Seminar aplikativno dopolnjuje vsebino predavanj z reševanjem praktičnih problemov.

**Management of multimedia learning material projects.**Seminar:

Application of lectures in practical cases and real world problems.

**Temeljna literatura in viri / Textbooks:**

Žalik Borut, Računalniške periferne naprave in uporabniški vmesniki : učbenik, FERi, Maribora, 2002  
 Gerlič Ivan, Debevc Matjaž, Dobnik Nadja, Šmitek Branislav, Korže Danilo, Stjepanović Zorna, Načrtovanje in priprava študijskih gradiv za izobraževanje na daljavo, FERi, Maribor, 2002  
 Gerlič Ivan, Sodobna informacijska tehnologija v izobraževanju, DZS, Ljubljana, 2000  
 Soleša Dragan, Nadrljanski Đorđe, Informatika, Univeza v Novem Sadu, Sombor, 2007  
 Microsoft Office Project 2003 Bible, Hoboken : Wiley Publishing, cop. 2004

**Cilji:**

podati poglobljeno teoretično znanje s področja multimedijjskih naprav  
 poglobljeno znanje multimedijjskih standardov in distribucije multimedijjskih podatkov  
 poglobljeno znanje elektronskih komunikacij.  
 razviti sposobnosti študentov za samostojno in kreativno reševanje praktičnih problemov.

**Objectives:**

Deep theoretical knowledge of multimedia equipment  
 Deep knowledge of multimedia standards and data distributions  
 Deep knowledge of electronic communications  
 Abilities to creatively solve problems in practice

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

Teoretično ozadje multimedijjskih naprav  
 Prednosti in slabosti kodirnih algoritmov  
 Organizacija distribucije in prenosa podatkov

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

Theoretical background of multimedia equipment  
 Advantages and disadvantages of coding algorithms  
 Organization of distributions and data transmission

Prenesljive/ključne spretnosti in drugi atributi:

Uporaba znanj pri izdelavi kakovostnih multimedijjskih predstavitev  
 Organiziranje in vodenje projektov za izdelavo multimedijjskih učnih vsebin

Transferable/Key Skills and other attributes:

Knowledge for development of quality multimedia presentations  
 Organizing and management of multimedia learning material development projects

**Metode poučevanja in učenja:**

experimentalna predavanja,  
 izdelava seminarske naloge.

**Teaching and learning methods:**

experimental lectures,  
 seminar work.

**Načini ocenjevanja:**

Način (pisni izpit, ustno izpraševanje, naloge, projekt):  
 seminarska naloga,  
 pisni izpit,  
 ustni izpit.

Delež (v %) /  
 Weight (in %)

**Assessment methods:**

Type (examination, oral, coursework, project):  
 seminar work,  
 written examination,  
 oral examination.

**30 %**  
**30 %**  
**40 %**

**Reference nosilca / Lecturer's references:**

KRAŠNA, Marjan, BRATINA, Tomaž. E-learning materials for social science students. V: LAMANAUSKAS, Vincentas (ur.). Philosophy of mind and cognitive modelling in education - 2014, (Problems of education in the 21st century, ISSN 1822-7864, vol. 61). Siauliai: Scientific Methodological Center Scientia Educologica, 2014, str. 77-87, ilustr. [COBISS.SI-ID 20948232]  
 DUH, Matjaž, BRATINA, Tomaž, KRAŠNA, Marjan. Elementary teachers competences for multimedia learning materials production = Kompetencije učitelja u osnovnim školama za pripremu materijala za multimedijjsko učenje. Informatologia, ISSN 1330-0067, 2013, vol. 46, no. 4, str. 333-342, tabele. [http://hrcak.srce.hr/index.php?show=clanak&id\\_clanak\\_jezik=167068](http://hrcak.srce.hr/index.php?show=clanak&id_clanak_jezik=167068). [COBISS.SI-ID 20275976]  
 KRAŠNA, Marjan, BRATINA, Tomaž, KAUČIČ, Branko. Smart e-testing : future trend of e-learning or gentle deviation. V: LAMANAUSKAS, Vincentas (ur.). Philosophy of mind and cognitive modelling in education - 2012, (Problems of education in the 21st century, ISSN 1822-7864, vol. 46). Siauliai: Scientific

Methodological Center Scientia Educologica, 2012, str. 85-92, ilustr. [COBISS.SI-ID 20433672]

KRAŠNA, Marjan, BRATINA, Tomaž. Video learning materials for better students' performance. V: 25th Central European Conference on Information and Intelligent Systems, September 17th-19th, 2014, Varaždin, Croatia. HUNJAK, Tihomir (ur.), LOVRENČIĆ, Sandra (ur.), TOMIČIĆ, Igor (ur.). Central European Conference on Information and Intelligent Systems CECIIS, 25th international conference, September 17th-19th, 2014, Varaždin, Croatia, (CECIIS, ISSN 1847-2001). Varaždin: Faculty of Organization and Informatics, 2014, str. 130-137, ilustr. [COBISS.SI-ID 20879368]

KRAŠNA, Marjan, BEDRAČ, Bojan. ICT didactics: the new study discipline is needed. V: MIPRO 2013, 36th International Convention, May 20-24, 2013, Opatija, Croatia. BILJANOVIĆ, Petar (ur.). MIPRO 2013 : Mipro proceedings, (MIPRO ... (CD-ROM), ISSN 1847-3946). Rijeka: Croatian Society for Information and Communication Technology, Electronics and Microelectronics, cop. 2013, str. 883-888. [COBISS.SI-ID 19874056]

BRATINA, Tomaž, DUH, Matjaž, KRAŠNA, Marjan. E-learning controversy in practical application. V: MIPRO 2013, 36th International Convention, May 20-24, 2013, Opatija, Croatia. BILJANOVIĆ, Petar (ur.). MIPRO 2013 : Mipro proceedings, (MIPRO ... (CD-ROM), ISSN 1847-3946). Rijeka: Croatian Society for Information and Communication Technology, Electronics and Microelectronics, cop. 2013, str. 928-933. [COBISS.SI-ID 19874312]