UČNI NAČRT PREDMETA / COURSE SYLLABUS

Predmet:	**Fizikalna multimedija**
Course Title:	**Multimedia in physics**

Študijski program in stopnja **Study programme** and level	Študijska smer **Study field**	Letnik Year	Semester Semester
Fizika		2	**3**
Physics			

Vrsta predmeta / Course type	**obvezni/compulsory**

Univerzitetna koda predmeta / University subject code: | X

Predavanja Lectures	Seminar Seminar	Vaje Tutorial	Lab. vaje Lab. Work	Terenske vaje Field work	Samost. delo Individ. work	ECTS
30			15		105	**5**

Nosilec predmeta / Lecturer: | Marjan Krašna

Jeziki/ Languages:	Predavanja / Lecture: Vaje / Tutorial:	slovenščina /Slovenian slovenščina (Slovenian

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti: | **Prerequisits:**

Pogojev ni.	None

študijskih obveznosti:

Vsebina:

1. Fizikalne osnove multimedije (prikazovalniki, snemalniki, pomnilni mediji, mrežni sistemi)
2. Multimedija in hipermedia v fiziki (načini prikazovanja informacij)
3. Standardi in zapisi multimedijskih vsebin (osnove MM standardov, kodiranje in kompresije)
4. Programska orodja za izdelavo MM gradiv (MM in programski jeziki, MM avtorska orodja, MM uporabniška orodja ...)
5. Produkcija in distribucija multimedijskih vsebin
6. Multimedijska promocija fizike
7. Konferenčni sistemi (audio in video)

Contents (Syllabus outline):

1. Multimedia physical background (presenters, recorders, memory, multimedia grids)
2. Multimedia and hypermedia in physics (Informatin presentation)
3. Multimedia standards (introduction to multimedia standards, coding and compression)
4. Software tool for multimedia production (program languages, authoring tools, user software)
5. Production and distribution
6. Multimedia promotion of physics
7. Conference systems (audio and video)

Temeljni literature in viri / Readings:

- Gerlič, Sodobna informacijska tehnologija v izobraževanju, DZS, Ljubljana, 2000.

- Florian Schmidt-Weingand, Designing Text and Visualizations in Multimedia learning (How to Overcome Split Attention Effects?), AkademikerVerlag, 2012
- Tone Vidmar, Računalniška omrežja z internetnimi storitvarmi, Pasadena, 2013
- Richard E. Mayer, Multimedia Learning (second edition), Cambridge University Press, 2009.
- Ruth Colvin Clark, Richard E. Mayer, E-learning and the Science of Instruction, John Wiley & Sons, 2008
- Mihaela van der Schaar, Philip A Chou, Multimedia over IP and Wireless Networks: Compression, Networking, and Systems, Elsevier, 2007
- Ralf Steinmatz, Klara Nahrstedt, Multimedia Applications, Springer-Verlag, 2004.
- Jens-Rainer Ohm, Multimedia Signal Coding and Transmission, Springer, 2015
- Kamisetty Rao, Zoran Bojkovic, Dragorad Milovanovic, Introduction to Multimedia Communications: Applications, Middleware, Networking, John Wiley & Sons, 2006
- Multimedijske in računalniške revije, npr. Monitor, Multimedia in Education, Computers systems...
- E-gradiva na spletni strani nosilcev predmeta

Cilji in kompetence

Študent bo po uspešno opravljenem izpitu:
- poznal fizikalne osnove multimedijskih predstavitev (analogno digitalna pretvorba, senzorji, prenos medijskih podatkov med napravami, fizikalne omejitve pri zajemu medijskih podatkov)
- samostojno pripravljal multimedijske predstavitve (zajemanje slike, zvoka in videa glede na namen predstavitve) in pripravil celovito podobo.
- poznal in razumel metrike kakovosti multimedijskih gradiv (ocenitev kakovosti slikovnega, zvočnega in video gradiva; primernost besedil glede na omejitve predstavitev)

Objectives and competences:

After passing the exam student will:
- understand physical basics of multimedia presentation (analog-digital transformation, sensors, transfer of multimedia data between different equipment, physical limitation in the multimedia data acquisition)
- Independently prepare multimedia presentations (acquiring of image, sound, and video according to the aim of the presentation) and prepare the design.
- understand and comprehension of quality matrices for multimedia materials (assessment of quality of image, sound, and video; suitability of text according to the presentation constraints)

Predvideni študijski rezultati:

Znanje in razumevanje:

- Študent bo **poznal** multimedijsko opremo (**vedel bo kako** se zajema slika, zvok in video, kateri zunanji pogoji vplivajo na kakovost zajetih podatkov, **poznal bo izkoristiti** opremo v danih pogojih).
- **Razumel** bo kako poteka produkcija multimedijskih vsebin (**poznal bo postopek** zajemanja, obdelave in predelave medijskih podatkov v različne zapise; **razumel bo razliko** med kompresijskimi algoritmi; **razumel bo omejitve** programske opreme za obdelavo medijskih datotek in **znal primerno uporabiti** programsko opremo, ki mu je v danih pogojih na voljo)
- **Poznal in razumel bo vlogo** izdelave promocij in predstavitev (**znal bo pripraviti** predstavitve za različne ciljne skupine, **razumel bo kdaj uporabiti** katere medijske elemente pri predstavitvah,

Intended learning outcomes:

Knowledge and Understanding:

- Student will know multimedia hardware (know how to acquire image, sound and video, know the external factors that influence the quality of acquired media data, know how to use equipment in given circumstances)
- He/she will understand how to produce multimedia material (know the process of acquisition of media data, editing the media data and conversion of media data; understand the differences between compression algorithms, understand the limitation of software for media editing and know how to use different software for media data in the given circumstances)
- He/she will know and comprehend the role of promotion and presentation (know how to prepare presentations for different target groups, understand when to use which multimedia elements in the

razumel bo razlike med predstavitvami v živo in na spletu).	presentations, understand the differences and limitations between live presentation and web presentations).
Prenesljive/ključne spretnosti in drugi atributi: • Poznavanje in delo z opremo za pripravo multimedijskih vsebin (za zajemanje slike, zvoka in videa) • Obdelava medijskih datotek.	Transferable/Key Skills and other attributes: • Understand and work with multimedia hardware (image, sound, and video acquisition) • Editing of multimedia files.

Metode poučevanja in učenja:	**Learning and teaching methods:**
Predavanja, laboratorijske vaje, multimedijski izdelek	lectures, laboratory work, multimedia work

Načini ocenjevanja:	Delež (v %) / Weight (in %)	**Assessment:**
Pisni izpit	**50%**	Written exam
Ustni zagovor multimedijskega izdelka	**50%**	Oral avocation of multimedia product
Vsaka izmed naštetih obveznosti mora biti opravljena s pozitivno oceno.		Each of the mentioned commitments must be assessed with a passing grade.
Opravljen ustni zagovor multimedijskega izdelka je pogoj za pristop k pisnemu izpitu.		Oral avocation of the multimedia product is a prerequisite for admission to the written exam.

Reference nosilca / Lecturer's references:

PUKŠIČ, Dejan, ZEMLJAK JONTES, Melita, KRAŠNA, Marjan. Materials design for language m-learning = Načrtovanje gradiv za mobilno učenje jezikov. Revija za elementarno izobraževanje, ISSN 1855-4431. [Tiskana izd.], dec. 2015, letn. 8, št. 4, str. 121-142, ilustr. [COBISS.SI-ID 283188736]

DUH, Matjaž, BRATINA, Tomaž, KRAŠNA, Marjan. The role of digital competences in electronic education = Uloga digitalnih kompetencija u elektronskoj nastavi. Media, culture and public relations : Mediji, kultura i odnosi s javnostima, ISSN 1333-6371, 2012, vol. 3, no. 2, str. 131-137. http://hrcak.srce.hr/index.php?show=clanak&id_clanak_jezik=130571. [COBISS.SI-ID 19447816]

KRAŠNA, Marjan. E-learning material from the effectiveness to the economics. V: SOLEŠA, Dragan (ur.), ŠIMOVIĆ, Vladimir (ur.), ROSI, Bojan (ur.). Innovation, ICT and education for the next generation, [May 26-27, 2017, Novi Sad, Serbia] : thematic proceedings, Conference Innovation, ICT and education for the next generation, Novi Sad, May 26-27th, 2017. Novi Sad: Faculty of Economics and Engineering Management. 2017, str. 365-381, ilustr. [COBISS.SI-ID 23221000]

ŽIŠKO, Andreja, ŠORGO, Andrej, KRAŠNA, Marjan. ICT support for promotion of nature park. V: BILJANOVIĆ, Petar (ur.). MIPRO 2017 : 40th Jubilee International Convention, May 22-26, 2017, Opatija, Croatia : proceedings, (MIPRO ... (Tisak), ISSN 1847-3938). Rijeka: Croatian Society for Information and Communication Technology, Electronics and Microelectronics - MIPRO. cop. 2017, str. 772-777, ilustr. http://docs.mipro-proceedings.com/proceedings/mipro_2017_proceedings.pdf. [COBISS.SI-ID 23137800]

KRAŠNA, Marjan. Project based learning (PBL) in the teachers' education. V: BILJANOVIĆ, Petar (ur.). Mipro proceedings, MIPRO 2016, 39th International Convention, May 30-June 3, 2016, Opatija, Croatia, (MIPRO ... (Tisak), ISSN 1847-3938). Rijeka: Croatian Society for Information and Communication Technology, Electronics and Microelectronics - MIPRO. cop. 2016, str. 957-961, ilustr. http://docs.mipro-proceedings.com/proceedings/mipro_2016_proceedings.pdf. [COBISS.SI-ID 22821896]

KRAŠNA, Marjan. Izobraževanje v digitalnem svetu, (Mednarodna knjižna zbirka Zora, 108). V Mariboru: Mednarodna založba Oddelka za slovanske jezike in književnosti, Filozofska fakulteta, 2015. 146 str., ilustr. ISBN 978-961-6930-30-7. [COBISS.SI-ID 82775809]