



Progres Report on Curriculum preparation and laboratory equipment for DBBT specialist studies Multimedia technologies

**Izveštaj o napredku u pripremi kurikuluma i lab. opreme
za DBBT specijalističke studije–Multimedijalne tehnologije**

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**Higher technical
professional school in
Zvečan**



Proposal courses

- ▶ Analyzed reviewers' remarks and approved by the HTPSZ
- ▶ Attuned list of proposed courses (lectures) for specialist professional studies – “Multimedia technologies”:
- ▶ Анализирани примедбе рецензената и прихваћене од стране ВТШСС Звечан
- ▶ Усаглашен списак предвиђених предмета за специјалистичке струковне студије “Мултимедијалне технологије”:

Proposal courses

	Tytle Course	Smester	Type	Stat us	Active teaching			Other	ECTS
					L	E	LE		
FIRST YEAR									
1	Multimedia systems	I	AP	M	3	1	0	0	6
2	Measuring in telecommunications	I	AP	M	2	1	1	0	6
3	Computer animation	I	AP	E/1	3	1	0-2	0	6
4	WEB programming	I	AP	E/1	3	3	0	0	6
5	Electric lighting design	I	AP	E/2	3	2	0	0	6
6	RTV engineering	I	AP	E/2	3	1	0-2	0	6
7	Human-computer interaction	I	AE	M	3	3	0	0	6

Proposal courses

	Tytle Course	Smester	Type	Stat us	Active teaching			Other	ECTS
					L	E	LE		
FIRST YEAR									
8	<u>Image and sound digital processing</u>	II	AP	M	3	1	1	0	5
9	<u>Audio and video production</u>	II	AP	E/2	3	1	0-1	0	5
10	<u>Internet and wireless sensor networks</u>	II	AP	E/2	3	2	0	0	5
11	<u>Entrepreneurship and innovations</u>	II	TM	E/2	3	2	0	0	5
12	<u>Research marketing</u>	II	AE	E/2	3	2	0	0	5
13	<u>Professional practice</u>	II		M	0	0	0	0	5
14	<u>Final thesis</u>	II		M	0	0	0	0	10



Laboratory equipment

- ▶ Procurement of equipment is planned to start in the coming weeks
- ▶ In accordance with the proposal courses, envisaged the following laboratory equipment:
- ▶ Набавка опреме ће бити покренута у наредним недељама.
- ▶ У складу са предвиђеним курсевима, предвиђена је следећа опрема:

Table 1: Laboratory Equipment

No.	Name	Quantity
1	Desk-top computers	3
2	Monitors for desk-top computers	3
3	Lap-top computers	3
4	Mini Converter SDI to Audio (4K) (embeder)	1
5	Mini Converter SDI to HDMI 4K	1
6	UltraScope	1
7	Oscilloscope	1
8	Lightening measurer with PC connection	1
9	Specter analyzer and measurer of EM fields	1
10	signal conditioner-current	4
11	signal conditioner-voltage	4
12	USB data acquisition system	1
13	DeckLink 4K Extreme kartica	1
14	ATEM Production Studio 4K	1
15	HDMI CABLE	1

Table 2: TV Studio Equipment

No.	Name	Quantity
1	Photo camera	1
2	Camcorder	1
3	Halogen studio lighting	1
4	LED studio lighting	1
5	Visico Muslin background green color	1
6	semi-open studio headphone	3
7	Professional carrier backgroundr	1
8	AUDIO MIXER	1
9	COMMUNICATION HEADPHONES WITH MICROPHONE	1
10	AUDIO MONITORING	1
11	SOUND CARD	1
12	VGA TO HDMI ADAPTER	1

Table 2: TV Studio Equipment

No.	Name	Quantity
13	HDMI VIDEO DISTRIBUTION	1
14	CD PLAYER	1
15	TV for CONTROL (with wall bracket)	1
16	HD Smart TV	2
17	COMMUNICATIONS HEADPHONES	2
18	AUDIO DISTRIBUTION	1
19	STUDIO MICROPHONE	2
20	STAND FOR MICROPHONE TABLE	2
21	ACOUSTICAL TRIM FOR MICROPHONE	2
22	AUDIO / VIDEO / DATA CABLES AND CONNECTORS	1
23	Zvučnici: Genius SW-HF5.1 4800	1

Table 3.1



Course Title	Multimedia systems
Status	Mandatory
ECTS	6
Content	Introduction to multimedia. Area of application. Multimedia hardware technologies. Platforms. Peripherals. Interfaces. Computer memory and data storage devices. Input devices. Output devices. Architecture of multimedia systems. Multimedia devices for processing video and audio signals. Formats for recording text, graphics, sound, still and moving images. Communication in multimedia technologies. Multimedia software technologies. Basic tools. Application of tools: Adobe Photoshop, Adobe Premier, Adobe After Effects, Cubase and Macromedia Flash. Synchronization of sound and image. Multimedia signal processing and compression procedures. JPEG compression. H261 and H263 standard. DV standard. MPEG1 and MPEG2 standard. MP3 standard. Multimedia signal distribution. Multimedia signal distribution across internet. Web and NET technologies. Multimedia system design.
Learnig outcomes	Capacitation for operating basic and advanced versions of software for processing multimedia signal, constructing multimedia content in the form of WEB pages, DVD`s, video tutorials and understanding communication techniques used for transfer and distribution of multimedia signal.
Literature	<ol style="list-style-type: none"> 1. Јевтић, М., Мултимедијалне комуникације, Академска мисао, Београд, 2014. 2. Станковић, С., Оровић, И., Мултимедијални системи, 3. Електротехнички факултет, Подгорица, 2011. 3. Halsall, F., Multimedia communications, Adison-Wesley, 2011. 4. Steinmetz, R., Nahrstedt, Multimedia Systems, Springer, 2014.
Methodology	Classes are auditory- held in classrooms using computer equipment. Seminary papers are submitted and defended and independent work in lab classes is intended. Knowledge acquisition is tested through colloquiums during the semester and group project task presentation.
Software/ Equipment	
Lectures	3
Exercises	1
Laboratory exercises	0
Other	0
Pre-Exam (Points)	60
Exam (Points)	40

Table 3.1



Course Title	Measuring in telecommunications
Status	Mandatory
ECTS	6
Content	Types and organization of telecommunication measuring. Telecommunication signal parameters. Measuring instruments. Passive components. Signal sources. Digital oscilloscope. Signal characterization in the time domain. Spectrum analyser. Signal characterization in the spectrum domain. Transfer system characterization. Network analyser. Noise measuring. Cable line measuring. Error place detection. Measuring results processing and presentation. Producing a report on conducted measuring. Linking lab instruments. Monitoring instruments using computers. Measuring results acquisition using computers. Virtual instrumentation. Telemetry.
Learnig outcomes	Upon passing the exam students will be able to: connect and link lab devices in a correct way, conduct advanced measuring of telecommunication signals and systems, import measuring results to computers process measuring results and write a report, Check the correspondence between the measuring results and relevant regulations and standards.
Literature	<ol style="list-style-type: none"> 1. Петар Правица, Иван Багарић, “Метрологија електричних величина”, Наука, Београд, 1993. 2. Др Милан Бјелица, “Телекомуникациона мерења 1”, збирка задатака ЕТФ Београд, 2013. 3. C. Rauscher: Fundamentals of Spectrum Analysis. Rohde & Schwarz, 2006. 4. J.M. Hughes: Real-World Instrumentation with Python. O'Reilly Media, 2011.
Methodology	Verbal using: graphoscope, multimedia. Practical using computers and labs. Demonstrational method using exemples.
Software/ Equipment	
Lectures	2
Exercises	1
Laboratory exercises	1
Other	0
Pre-Exam (Points)	50
Exam (Points)	50

Table 3.1

Course Title	Computer animation
Status	Elective
ECTS	6
Content	Introduction, concepts, terminology, computer animation technology. User interface in Maya 3D programme environment, node system organization, work environment, three dimensional coordinate system and transformations within it, basic transformations (translation, rotation, scaling), perspective change. Computer animation technologies, terminology. Motion, timing, technology of extreme, key frame animation. Terminology; extreme, phases, action axis, action line...Graph editor, animation with interpolation control between the key frames. Path animation. Hierarchy creation. Introduction to operation principles of controls for object animation, as well as deformers and its attributes. Character rigging. Object character, application of animation principles with the aim to put emphasis on animated objects. Bipod characters, animation, design. Basic animation characteristics; walk cycle; Expressing character using animation. Pose, motion, time. Walk cycle of different characters' comparative animation. Idea, synopsis, scenario, storyboard, character design. Project preparation. Act and expression. Cartoony walk animation. Specific situation character animation. Working on a project.
Learnig outcomes	Students will have an opportunity to learn about the basics of character animation, act and body language, acquire character animation of bipod 3D models, animate speech according to the sound matrix, and apply animation principles in a 3D tehnique
Literature	<ol style="list-style-type: none"> 1. Alias/Wavefront, The Art of Maya, Syb, 2007. 2. G. Maestri, Character animation 2 – Volume 2: Advanced Techniques, New Riders, Indiana, 2002. 3. R. Williams, The Animator`s suvirval kit, Faber and Faber, New York, 1995. 4. Harold Whitaker, John Kalas, Timing for animation, Focal Press, 2002. 5. Mark T. Byrne, The Art of Layout and Storyboarding, A Mark T. Byrne Publication, Ireland, 1999
Methodology	Classes are auditory– held in classrooms using computer equipment. Seminary papers are submitted and defended and independent work in lab classes is intended. Knowledge acquisition is tested through colloquiums during the semester and group project task presentation
Software/ Equipment	
Lectures	3
Exercises	1
Laboratory exercises	2
Other	0
Pre-Exam (Points)	50
Exam (Points)	50

Table 3.1



Course Title	WEB programming
Status	Elective
ECTS	6
Content	Error removal. Dynamic application publishing. Communication protocols. NTTP protocol – request/answer. Client–server architecture, Static and dynamic content. XHTML hypertext markup languages. Basic concepts. Basic rules and syntax of XHTML languages. CSS technologies. XHTML+CSS.XML language. Basic concepts. XML document structure. Client programming. JavaScript, ActiveX, Java applet. Server programming. Basic tools for the development of RHR programme. Programme development in RHR surrounding. Variables and constants. Programme current control. Functions. Data base operation. ASP, CGI, Java Servlet. Error removal. Publication of dynamic applications.
Learnig outcomes	Students are enabled to develop and implement client and server scripts as dynamic WEB applications connected to the data base. Knowledge acquisition in the area of WEB programming and WEB server operation. Upon completion of the course student acquire integrated theoretical and applied knowledge in the area of modern WEB technologies.
Literature	<ol style="list-style-type: none"> 1. L. Welling, L. Thomson, PHP i MySQL Развој апликација за Web, Микро Књига, 2004.. 2. Десимировић, Н., Ранђеловић, М., Web дизајн, РС књига Београд 2005. 3. М.Брковић, Д.Милошевић, "Практикум за развој Web апликација", Технички факултет, Чачак, Универзитет у Крагујевцу, 2004. 4. A. Moller, M. Schwartzbach, "An Introduction to XML i WEB Technologies", Addison Wesley, Person Education Limited, 2006.
Methodology	Classes, presentations and practical work. One colloquium and a written test is intended.
Software/ Equipment	
Lectures	3
Exercises	3
Laboratory exercises	0
Other	0
Pre–Exam (Points)	50
Exam (Points)	50



Course Title	Electric lighting design
Status	Elective
ECTS	6
Content	Introductory class (course organization and content). Technical regulations for conducting electric lighting. Standards and recommendations. Light as a physical and sense phenomenon. Electric source of light. Division and functioning principles. Light bulbs. Classification, sections and photometric data. LED lighting. Physical principles and technologies. Interior lighting quality factors. Interior lighting photometric calculations. Scene lighting. Lighting for studio filming. Industrial premises lighting. Necessary and emergency lighting. Road surface. Road lighting. Tunnel lighting. Reflector lighting. Sport halls lighting. Electric lighting design using computers. Electric lighting monitoring systems, software and devices
Learnig outcomes	Students will be enabled to design and conduct electric lighting.
Literature	<ol style="list-style-type: none"> 1. М. Костић, Водич кроз свет технике осветљења, Minel-Schreder, Београд, 2000. 2. М. Костић, Осветљење путева, Minel-Schreder, Београд, 2006. 3. И. Влајић-Наумовска, Н. Кнежевић, Електричне инсталације и осветљење-приручник за лабораторијске вежбе, Висока школа електротехнике и рачунарства, Београд, 2009.
Methodology	Interactive participation during classes,lab classes,consultations with the aim to encourage student independent initiative.Colloquiums as the control measure of regularity in acquiring knowledge. Written exam.
Software/ Equipment	
Lectures	3
Exercises	2
Laboratory exercises	0
Other	0
Pre-Exam (Points)	50
Exam (Points)	50

Course Title	RTV engineering
Status	Elective
ECTS	6
Content	<p>Theoretical classes</p> <p>Introductory class. Analogue and digital audio and video technologies. Standards regarding the analogue and digital audio and video technologies.. easurement devices in the analogue and digital RTV systems.. Medium for connecting audio/video devices. Coaxial cables. Microphone cables. Multicore cables. Optical cables. UTP cables. Interface. Cabling. Audio and video devices of different formats (SD, XD, UXD). Cameras. Video mixers. Audio mixers. Microphones. Loudspeakers. Matrix. Switchers. Splitters. Different converters. Embedders. De-embedders.... Synchronization and timing of analogue and digital devices in RTV systems. RTV system monitoring (CRT, LCD, plazma, LED, multiviewer, loudspeakers). RTV system design and realization with the devices of the similar and different formats. Analogue and digital RTV system design via Internet.. Broadcast vehicle. Digital radio. Standards DAB / DAB+ / DMB. Medium for recording audio/video signals of different formats.</p> <p>Practical classes:</p> <p>Practical classes are in accordance with the theoretical classes and are conducted in a form of lab exercises, where each student receives a concrete task to solve on the device. Students are expected to design, realize and adjust a micro RTV system during the lab class practice.</p>
Learnig outcomes	Upon completion of the course students will have mastered operating capabilities of the most significant devices used in RTV systems, as well as the role and the engineering tasks in the chain of video and audio processing
Literature	<ol style="list-style-type: none"> 1. Миле Петровић, Белешке са предавања у виду скрипте са PowerPoint презентацијама. 2. Миле Петровић, Ивана Милошевић, Приручник за лабораторијске вежбе из Телевизијских система и видео технологија, 2015, 1. издање, Висока школа електротехнике и рачунарства, Београд, COBISS,SR-ID 218310412, ISBN 978-86-7982-231-4 3. M.Weise, D. Weynand, How Video Works, SAD, Focal Press, 2004. 4. Robert L. Hartwig, "Basic TV Technology: Digital and Analog", Fourth Edition, Focal Press, 2005. 5. M. Noll: Television Technology: Fundamentals and Future Prospects, Artech House, Norwood, MA. 2006.
Methodology	Theoretical classes, Lab classes– practical classes using RTV devices, Class projects – individual and group, colloquiums and an oral exam.
Software/ Equipment	
Lectures	3
Exercises	1
Laboratory exercises	2
Other	0
Pre-Exam (Points)	70
Exam (Points)	30



Course Title	Human-computer interaction
Status	Mandatory
ECTS	6
Content	<p>I part – HCI development and problems. Interaction development directed at the user and his active participation. Interaction and interface concepts. Interface as human agent regarding the artificial surrounding. Interface design discussion from the aspect of: user, programmer and designer. Interface examples. Applicability concept. Cognitive, social and emotional aspects of interface design between the humans and the computer.</p> <p>II part– User interface design. GUI–Web user interface. The importance of a well-planned design. Design process. Familiarity with the user profiles. Organization of interface graphic presentation. The system of menus and windows. Menu types and features. Windows types and features. Interface administrative tools. GUI administrative tools. Text in the interface. Feedback and Help. Accessibility. Icon creation. Color in interface.</p> <p>III part – Web design. Web location design procedure. Web user characteristics and applicability. Location architecture and navigation systems. Web page design elements. Page type and organization. Text and color use.</p>
Learnig outcomes	Students are expected to master diverse techniques for the development of an interface between the humans and the computer. Students should be able to develop different aspects of communication between the humans and the computer depending on the surrounding where the application is being used
Literature	<ol style="list-style-type: none"> 1. Дијана Каруовић, Драгица Радосав, Интеракција човек – рачунар, Универзитет у Новом Саду, Технички факултет "Михајло Пупин", Зрењанин, 2011. 2. М Бањанин., „Комуникациони инжењеринг”, Саобраћајно технички факултет, Добој, 2007. 3. Alan Dix: Human-computer Interaction, Prentice-Hall, 2004.
Methodology	Classes are conducted in amphitheatres equipped with video projectors. Students are introduced to available software tools. Interfaces of diverse complexity and minimal functionality, whose quality is assessed and implemented during lab classes.
Software/ Equipment	
Lectures	3
Exercises	3
Laboratory exercises	0
Other	0
Pre-Exam (Points)	60
Exam (Points)	40

Table 3.1



Course Title	Image and sound digital processing
Status	Mandatory
ECTS	5
Content	1. Introductory class. Digital image and sound concept2. Digital image formation. Image enhancement in the spatial domain. Image enhancement in the frequency domain. 4. Gray image quality enhancement Image restauration. 5. Colour image editing. 6. Image compression with and without loss 7. Image analysis (extracting edges, segmentation...). 8. Generating and perception of sound. 9. Audio signal processing: mixing, changes regarding amplification of sound. Corrections, filtering, echo effects, compression/expansion, changing the tone pitch and sound colour. 10. Speech and music signal characteristics 11. Speech signal modelling12. Speech signal coding and transfer techniques.
Learnig outcomes	The aim of this course is to enable students to understand modern principles and methods used in sound and image digital editing and the possibility to expand the knowledge regarding certain problems.
Literature	1. М. Поповић, "Дигитална обрада слике", Академска мисао, Београд, 2006. 2. R. Gonzalez, R. Woods, Digital Image Processing, Prentice Hall, 2002. 3. С. Јовичић, "Говора комуникација–физиологија, психоакустика и перцепција", Наука Београд, 1999. 4. B. Gold and N. Morgan, "Speech and audio Signal Proc.– Proc. And perception of Speech and Music", JW&S 2000
Methodology	Classes are auditory– held in classrooms using computer equipment. Seminary papers are submitted and defended and independent work in lab classes is intended. Knowledge acquisition is tested through colloquiums during the semester and group project task presentation, written and oral exam testing
Software/ Equipment	
Lectures	3
Exercises	2
Laboratory exercises	1
Other	0
Pre-Exam (Points)	60
Exam (Points)	40

Table 3.1

Course Title	Audio and video production
Status	Elective
ECTS	5
Content	Introductory class; The process of creation and design of multimedia content. Project phases; Multimedia elements: video-filming, editing and post-production; Multimedia elements: sound- technical and aesthetic principles of using sound in multimedia; Multimedia and television: television advertisement; Multimedia elements: text fonts, typography, using text in multimedia; Title design (Motion Graphics); Image and colour in multimedia; Animation as the part of multimedia; Interactiveness in multimedia projects; Multimedia delivery and archive. Analysis and discussions on the theme of multimedia projects.
Learnig outcomes	The purpose of this course is to enable students to conduct complex multimedia projects, videos, clips and short films with special effects
Literature	<ol style="list-style-type: none"> 1. Александар Кајевић, Мултимедијска продукција, ВИШЕР, 2015.. 2. Film Directing Shot by Shot, Visualizing from Concept to Screen – Steven D. Katz. 3. The Technique of film and Video Editing 4th ed. – K. Dancyger (Focal, 2007) BBS. 4. Trick Photography and Special Effects.
Methodology	Classes are auditory- held in classrooms using computer equipment. Seminary papers are submitted and defended and independent work in lab classes is intended. Knowledge acquisition is tested through colloquiums during the semester and group project task presentation.
Software/ Equipment	
Lectures	3
Exercises	1
Laboratory exercises	1
Other	0
Pre-Exam (Points)	50
Exam (Points)	50

Course Title	Internet and wireless sensor networks
Status	Elective
ECTS	5
Content	Basic knowledge regarding wireless sensor networks: limits and challenges, advantages, application, mutual cooperation in the area of information processing, key definitions. Physical level characteristics: localization, tracking scenario, defining problems. Multimedia approach characteristics: information transfer regarding condition, tracking several objects, sensor objects, comparison and metrics. Network level and routing: assumptions, MAC, S-MAC protocol, IEEE 802.15.4 standard and Bluetooth, ZigBee, 6LoWPAN, geographic and energetic advanced routing, attribute routing. Establishing infrastructure: topology, grouping, synchronization, localization and services. Sensor network platforms and tools: programming challenges, hardware and software platforms (TinyDB, nesC, TinyGALS). Application and the future of internet and wireless sensor networks.
Learnig outcomes	Students should be able to acquire basic principles of internet and wireless sensor system organization; to recognize functionality of the modern sensors and their characteristics; to design systems for tracking and collecting data in fire protection intelligent systems using modern sensors, computer devices and software tools.
Literature	<ol style="list-style-type: none"> 1. Зоран М. Урошевић: Увод у рачунарске телекомуникације и мреже; транспортни део, Технички факултет у Чачку 2004.. 2. Jacob Fraden: Handbook of Modern Sensors: Physics, Designs, and Applications, Springer 2010. 3. Feng Zhao, Leonidas J. Guibas: Wireless Sensor Networks, Elsavier, 2004. 4. J.A. Stankovic: Secure Localization and Time Synchronization for Wireless Sensor and Ad Hoc networks, Springer 2007. 5. Vestermanov ELEKTROTEHNIČKI PRIRUČNIK" – G.Brechmann, C.W.Dzieia, R.E.Hornemann, H.H.Hubscher, L.D.Jagla, N.J Klaue (priredili: gordana Spaić, Mirko Popović, Julija Stević, Vera Stojadinović)– GRAĐEVINSKA KNJIGA BEOGRAD 2000.
Methodology	Classes are auditory– held in classrooms using computer equipment. Seminary papers are submitted and defended and independent work in lab classes is intended. Knowledge acquisition is tested through colloquiums during the semester and group project task presentation.
Software/ Equipment	
Lectures	3
Exercises	2
Laboratory exercises	0
Other	0
Pre-Exam (Points)	50
Exam (Points)	50

Table 3.1



Course Title	Entrepreneurship and innovations
Status	Elective
ECTS	5
Content	Entrepreneurship (the nature of entrepreneurship and definitions, innovation development, economic and social contribution of entrepreneurship, conceptual depiction of entrepreneurship); Concept of entrepreneurship ('big man' concept, the school of "psychological characters", entrepreneurship–the ability to spot chances, "leadership" entrepreneur school, "internal entrepreneurship" concept, Creativity–innovation(innovation entrepreneurship, innovation entrepreneur, entrepreneur atmosphere, individual within a team, innovation factors, creative individual); Types and development of an entrepreneur (big and small entrepreneurship, factors which encourage entrepreneurship, organization environment for internal and external entrepreneurship); Entrepreneurship and innovation (purposeful innovation, characteristics and skills of an entrepreneur, entrepreneur–innovator, a new product development–innovation); Management and entrepreneurship(entrepreneur strategies, entrepreneur choice of ideas, entrepreneur incubators, a business plan, communication, entrepreneur bon ton).
Learnig outcomes	Students will be enabled to independently assess business chances, their market valorization, assess individual entrepreneurial abilities, as well as model and implement entrepreneurial strategies, all of which creates a precondition for a successful launching of an independent business and its management under the conditions of a market structure.
Literature	<ol style="list-style-type: none"> 3. Сајферт: Предузетништво, Универзитет у Новом Саду, Технички факултет "Михајло Пупин" Зрењанин, Зрењанин 2004 P. Drucker: Предузетништво, ФАБУС, Нови Сад 2008. М.Јовановић, М. Живковић, А. Лонговић, Д. Вељковић: Предузетништво, Мегатренд универзитет примењених наука, Београд, 2004.
Methodology	Lectures, lab classes, revision, consultations, concrete problem discussions in the area of entrepreneurship, presentations, seminary papers.
Software/ Equipment	
Lectures	3
Exercises	2
Laboratory exercises	0
Other	0
Pre–Exam (Points)	40
Exam (Points)	60

Table 3.1



Course Title	Research Marketing
Status	Elective
ECTS	5
Content	The concept of marketing; Basic concepts of marketing; Marketing dimensions; Marketing as a business function; Marketing management; Micro and macro marketing; Marketing environment; Marketing mix; Promotional marketing, creating a promotional message; Competition; Marketing strategies; A new product strategies; Integrated marketing communication; marketing programme formulation, the product of the day, distribution promotion; Basic marketing strategies; Business operation internationalization; Specific aspects of marketing.
Learnig outcomes	Students will be enabled to independently engage in the process of creating marketing campaigns for the purpose of conquering the market. Students will use the acquired knowledge in the area of marketing to recognize different market and business phenomenon and when solving problems which stem from the market theory and practice.
Literature	<ol style="list-style-type: none"> 1. М. Милосављевић: Основи маркетинга, Економски факултет, Београд 2004. 2. Ф. Котлер: Маркетинг менаџмент, Дата статус, Београд, 2006. 3. Б. Ракић, Маркетинг, Мегатренд, Београд 2008.
Methodology	Classes are conducted in a form of lectures and auditory exercises. Theoretical basics and principles of marketing are presented during lectures and a more detailed insight of postulates using practical examples and student-teacher interaction during auditory exercise.
Software/ Equipment	
Lectures	3
Exercises	2
Laboratory exercises	0
Other	0
Pre-Exam (Points)	40
Exam (Points)	60

Table 3.1



Course Title	Professional practice
Status	Mandatory
ECTS	5
Content	The professional practice content is in accordance with the aims of the practice. It is formed for each candidate independently, in agreement with the management of an enterprise or institution where the professional practice is being conducted, and in accordance with the module curriculum of the course which the student is attending. Students are intended to perform professional practice at a TV network (TV Most, TV Mir, TV KM, Mreza).
Learnig outcomes	Enabling students to apply the acquired theoretical and professional knowledge to solve concrete practical engineering problems within the chosen enterprise or an institution. Acquainting students with the work activities of a chosen enterprise or institution, work conduct, leadership, the position and the role of an engineer within the organizational structure. Developing students` abilities allowing them to engage in the work process upon the completion of education. Development of responsibility, professional approach to work and communication skills within a team. Complementing theoretical knowledge acquired during the course and practical understanding of problems studied within the course which the student attends. Benefitting from the experience of experts employed in the institution where the professional practice is being conducted with the aim to expand practical knowledge and motivate students. Acquiring a clear perspective regarding the possibility of applying in practice the acquired knowledge and skills included in the course.
Literature	1.
Methodology	Consultations and professional practice journal where the student describes the activities work that he has performed during the professional practice period.
Software/ Equipment	
Lectures	0
Exercises	0
Laboratory exercises	0
Other	0
Pre-Exam (Points)	60
Exam (Points)	40

Table 3.1



Course Title	Final thesis
Status	Mandatory
ECTS	10
Content	<p>Procedure regarding the writing and defending of the thesis is determined by the Rulebook which defines the manner and procedures of defending the thesis. The student achieves the right to start working on the thesis if he has three exams left to pass. The student chooses one of the courses he has passed, and the course lecturer as his mentor. Mentor defines the title of the thesis and problems to be dealt with within the thesis, upon which the student can submit the thesis. Student should complete the writing of the thesis in a period of at least three weeks, and maximum six months from the day of submitting the thesis. During the period of working on the thesis student is obliged to have consultations with the mentor. The final version of the thesis should have 20 to 40 pages on A4 page format, regardless of reference. Presentation of the thesis on recommended 10 to 20 slides is a compulsory addition to the final version of the thesis. Technical treatment and the content quality of the thesis should be in accordance with the Regulations regarding the technical treatment of thesis which is the integral part of Regulations on the manner and procedures of preparing and defending the thesis. The mentor confirms the content and technical treatment quality by signing each copy of the thesis. When the student completes the thesis, he submits a written request for defending the thesis to the professor council, and the four copies of the thesis together with the request. Each copy of the thesis should contain the entire text of the thesis in electronic form (CD). Professor council appoints a panel for the public oral defending of the thesis, which consists out of the president, the mentor, and at least one of the professors of Higher Technical Professional School in Zvečan. The panel can have additional members consisting out of the professors of other higher school institutions or eminent experts in the area presented in the thesis.</p>
Learnig outcomes	The purpose of writing the final thesis is solving and/or analysing and presentation of the practical problem, by which the student proves to have acquired an intended degree of professional qualification and maturity in a specific area of technical engineering.
Literature	1.
Methodology	The thesis is defended orally in front of the panel; the student is obliged to prepare a short presentation (15 min) within which he presents the basic problems and solutions; the members of the panel have a right to ask questions and evaluate the thesis as the whole.
Software/ Equipment	
Lectures	0
Exercises	0
Laboratory exercises	0
Other	0
Pre-Exam (Points)	0
Exam (Points)	100



Thank you for your attention !

Хвала на пажњи !



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Presentation of proposal equipment for DBBT specialist studies Multimedia technologies

Prezentacija predložene opreme za DBBT specijalističke studije–Multimedijalne tehnologije

- dr Bojan Prlinčević, dr Uroš Jakšić
- Madrid, Technical University of Madrid, 28–29.09.2016



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- ▶ Higher Technical Professional School in Zvečan under DBBT project opens specialist study program Multimedia technologies.
- ▶ List of proposed courses (lectures) for specialist professional studies – “Multimedia technologies”:
- ▶ Висока техничка школа струковних студија Звечан у оквиру DBBT пројекта отвара специјалистички студијски програм Мултимедијалне технологије.
- ▶ Списак предвиђених предмета за специјалистичке струковне студије “Мултимедијалне технологије”:



	Semester 1
1.1	Multimedia systems (C)
1.2	Measuring in telecommunications (C)
1.3.1	Computer animation (E)
1.3.2	WEB programming (E)
1.4	Electric lighting design (C)
1.5	Human-computer interaction (C)

	Семестар 1
1.1	Мултимедијални системи (О)
1.2	Мерења у телекомуникацијама (О)
1.3.1	Компјутерска анимација (И)
1.3.2	WEB програмирање (И)
1.4.1	Дизајн електричног осветљења (О)
1.4.2	Интеракција човек рачунар (О)

► List of proposed courses:

	Semester 2
2.1	Image and sound digital processing (C)
2.2.1	Audio and video production (C)
2.2.2	Internet and wireless sensor networks (E)
2.3.1	Entrepreneurship and innovations (E)
2.3.2	Research marketing (E)
2.4	Professional practice (E)
2.5	Final thesis (C)

► Листа предложених предмета :

	Семестар 2
2.1	Дигитална обрада слике и звука (O)
2.2.1	Аудио и Видео продукција (O)
2.2.2	Интернет бежичне сензорске мреже (И)
2.3.1	Предузетништво и иновације (И)
2.3.2	Маркетинг истраживање (И)
2.4	Стручна пракса (O)
2.5	Завршни рад (O)



- ▶ In accordance with the proposal courses we plans to open and innovate exsisted laboratories for practical training of students:
 - ▶ Laboratory of sound processing
 - ▶ Laboratory for image and video processing, and
 - ▶ Measurement laboratory
- ▶ У складу са предвиђеним предметима планирано је отварање и иновација постојећих лабораторија за практичну обуку студената:
 - ▶ Лабораторија за обраду звука
 - ▶ Лабораторија за обраду слике и видеа, и
 - ▶ Мерна лабораторија (иновирање).



- ▶ Proposal equipment for Laboratories:
- ▶ Предвиђена опрема за лабораторије:



1	DeckLink 4K Extreme kartica	1
2	UltraScope	1
3	ATEM Production Studio 4K	1
4	HD Smart TV	2
5	Mini Converter SDI to HDMI 4K	1
6	Mini Converter SDI to Audio (4K) (embeder)	1
7	Fotoapararat	1
8	Camcorder	1
9	Halogena st. rasveta	1
10	LED st. rasveta	1
11	Visico Muslin pozadina zelena boja sa prof nosačem	1
12	St. polu-otvorene slušalice	3
13	AUDIO MIKSER	1



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14	KOMUNIKACIJSKE SLUŠALICE SA MIKROFONOM	1
15	AUDIO MONITORING	1
16	ZVUČNA KARTICA	1
17	VGA TO HDMI ADAPTER	1
18	VIDEO HDMI DISTRIBUCIJA	1
19	CD PLEJER	1
20	TELEVIZOR KONTROLNI (sa zidnim nosačem)	1
21	KOMUNIKACIJSKE SLUŠALICE	2
22	AUDIO DISTRIBUCIJA	1
23	ST. MIKROFON sa stalkom i oblogom	2
24	Zvučnici:	1
25	AUDIO/VIDEO/DATA KABLOVI I KONEKTORI	



► :

26	USB sistem za akviziciju podataka	1
27	Kondicioner signala-voltage	4
28	Kondicioner signala-current	4
29	Specter analyzer and measurer of EM fields	1
30	Lightening measurer with PC connection	1
31	Osciloskop	1
32	Desk-top computers	3(4)
33	Monitori za desk top	3(4)
34	Lap-top computers	3
35	Softver	
36	Literatura	
37		



Thank you for your attention !

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