

## UNIVERSITY OF SPLIT

FACULTY OF ELECTRICAL ENGINEERING, MECHANICAL ENGINEERING AND NAVAL ARCHITECTURE

## DETAILED PROPOSAL OF THE STUDY PROGRAMME

UNDERGRADUATE VOCATIONAL STUDY IN ELECTRICAL ENGINEERING

SPLIT, April 2024

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# GENERAL INFORMATION OF HIGHER EDUCATION INSTITUTION

Name of higher education institution	FACULTY OF ELECTRICAL ENGINEERING, MECHANICAL ENGINEERING AND NAVAL ARCHITECTURE
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### **GENERAL INFORMATION OF THE STUDY PROGRAMME**

Name of the study programme	ELECTRICAL ENGINEERING							
Provider of the study programme	FACULTY OF ELECTRICAL ENGINEERING, MECHANICAL ENGINEERING AND NAVAL ARCHITECTURE							
Other participants								
Type of study programme	Vocational study pr ⊠	ogramme	University study programme $\Box$					
	Undergraduate 🖂	Undergraduate 🛛 Graduate 🗆		Integrated				
Level of study programme	Postgraduate 🗆	Postgraduat	te specialist 🗆	Graduate specialist				
Academic/vocational title earned at completion of study	Vocational Bachelor in Electrical Engineering							

### 1. INTRODUCTION

#### **1.1.** Reasons for starting the study programme

Electrical engineering is a field of science and engineering that encompasses the research and application of electrical phenomena. Similar to other branches of engineering, electrical engineering serves as a link between mathematics, physics and other natural sciences on one part, and on the other part, their practical applications. Widely diverse forms of practical applications of electrical engineering can be in the general sense divided into two basic groups: applications related to electrical energy and applications.

The area of electrical engineering has become exceptionally wide and interdisciplinary, and there is virtually no human activity in which electrical engineering does not contribute, significantly fostering their development. One of the main features of the field of electrical engineering is its rapid development. The demands of the developed society for electrical energy are continually growing, creating constant demand for development of devices for energy conversion and seeking new and environmentally acceptable systems for distribution of electrical energy. Striking development of the electronic computers technology enabled their application in nearly all areas of human activity. Development of microelectronics and computer technology enabled the development of the area of information and telecommunication technology, which became one of the most promising sectors of economy. Information transfer, i.e. image, voice and data transfer came to represent one of major prerequisites for the development of modern society. State-of-the-art computer technology enables major breakthroughs in the quality of automated control in the processing industry, control of vessels and aircrafts, complex robots and modern medical devices. Continuous and rapid development of this area, driven by new findings and achievements, necessarily requires corresponding educational processes. Well-educated professionals are an essential prerequisite for progress and keeping pace with the developed countries.

The goal of the proposed study programme in Electrical Engineering is to educate professional staff in the area of electrical engineering, to meet the demands of the industry, governmental and other public institutions.

# 1.2. Relationship with the local community (economy, entrepreneurship, civil society, etc.)

The goal of the proposed undergraduate vocational study programme in Electrical Engineering is to educate professional staff in the area of electrical engineering, to meet the demands of the industry, governmental and other public institutions. One of the basic tasks of the Faculty is the education of young professionals who will use their knowledge, skills and abilities to become stakeholders in the economic and general development of local and wider community. Having been training leading professionals for more than 55 years, the Faculty successfully accomplished its task, providing

necessary human resources to participate in the development of economy sectors based on different branches of engineering. The Faculty trained professionals who significantly contributed to economic development in the region, thus supporting the region to initiate and successfully develop high-tech based production activities with its own human resources potential. Successful development of the Dalmatian region power system was facilitated by the efforts of power engineering professionals trained at FESB. Of special importance is the influence FSB had on development of IT sector in the region. Early developments started back in 1966, with the purchase of the first computer funded by local enterprises and establishment of the Computer Centre at FESB. This was the first computer purchased in town and the first installed computer at a higher education institution in Croatia, representing a major breakthrough which allowed for gaining valuable experience, not only in teaching and research activities at the Faculty, but also in IT education and can be considered as the starting point in development of IT sector in the region. Professionals trained at FESB are the founders of a number of ICT companies in the Split-Dalmatia County and town of Split.

#### **1.3.** Compatibility with requirements of professional organizations

The study programme is compatible with the requirements of the Croatian chamber of electrical engineers.

# 1.4. Name possible partners outside the higher education system that expressed interest in the study programme

FESB is a signatory to a number of cooperation agreements with the aim of promoting academic and educational activities, concluded with private enterprises and public organisations, e.g. Ericsson Nikola Tesla, Hrvatska elektroprivreda (national power company), Split-Dalmatia County, Ministry of Defence, Energy institute "Hrvoje Požar", Croatian Telecom, Croatian academic and research network - CARNet, Technology Centre Split, Brodosplit, Siemens, VIPnet, Microsoft Croatia, etc. It is important to note that the Croatian Armed Forces expressed a special interest in cooperation, since prospective officers are trained at the Faculty.

#### 1.5. Financing

The study programme is financed by the Ministry of Science and Education.

# 1.6. Comparability of the study programme with other accredited programmes in higher education institutions in the Republic of Croatia and EU countries

During the implementation of the study programme in Electrical Engineering, the Faculty is actively pursuing the process of development in higher education on global level, and especially in Europe. When developing the new curriculum, special attention was given to consolidating the curriculum and course contents with other renowned

foreign higher education institutions. The educational systems in the field of electrical engineering differ a lot, both worldwide and in Europe, and there are practically no countries with identical educational systems. The former applies to almost all components of education: type and organisation of studies, fields of study, duration of studies, titles and degrees awarded at individual institutions, names of higher education institutions, etc. As a rule, the first stage is acquiring knowledge of mathematics and fundamental natural sciences, followed by core courses in electrical engineering and information technology and specific specialist courses related to particular branches of electrical engineering. In addition, the programme includes a number of non-engineering courses. The study programme proposal is consolidated with the recommendations given in the framework of the ERASMUS project THEIERE (Towards the Harmonisation of Electrical and Information Engineering Education in Europe, http://www.eaeeie.org/theiere/). Based on the analysis of the study programmes in Electrical Engineering and Information Technology at 87 European universities, a proposal was prepared for organisation of the study programme in Electrical Engineering and the ratio of each of the mentioned components. The organisation of the proposed study programme is comparable with related study programmes at the following European institutions:

- Techniche Univerzität Wien/ Engineering University Vienna, Austria <u>http://www.tuwien.ac.at/informationen\_fuer/studierende</u>
- Fachhochschule Regensburg, Regensburg/ Regensburg University of Applied Sciences, Germany https://www.oth-regensburg.de/

# 1.7. Openness of the study programme to student mobility (horizontal, vertical in the Republic of Croatia, and international)

Undergraduate vocational study programme in Electrical Engineering enables vertical and horizontal mobility of students. In terms of vertical mobility, the graduate university study programme in Electrical Engineering can primarily be followed undergraduate vocational study programme in Mechanical Engineering can be followed by the specialist graduate vocational study programme implemented at the University Department of Professional Studies. If they pass differential exams and acquire additional ECTS credits, students may be admitted to one of the graduate university study programmes at FESB. In terms of horizontal mobility, undergraduate vocational study programme in Electrical Engineering is open for mobility of students of related studies at all Croatian universities and higher education institutions in Croatia. Students have the opportunity to complete a part of the study programme at a similar institution in Croatia or abroad. The comparability of the study programme with similar study programmes enables the students to fulfil a part of their course requirements at other higher education institutions in Croatia or abroad.

# 1.8. Compatibility of the study programme with the University mission and the strategy of the proposer, as well as with the strategy statement of the network of higher education institutions

Undergraduate vocational study programme in Electrical Engineering conforms with the Strategy of the University of Split 2015-2020. In addition to mission and vision of the University of Split, in the process of defining strategic goals, the following strategic documents were taken into account as guidelines:

- EUROPA 2020 strategy for smart, sustainable and inclusive growth,
- Strategic documents of the European Research Area (ERA),
- Strategic documents of the European Higher Education Area (EHEA),
- Strategy of Education, Science and Technology of the Republic of Croatia.

Preparation of the study programme was done in line with the mission, vision and goals which are partly derived from the Scientific Strategy of the University of Split 2009 – 2014, document which promotes creation of internal development plans at the level of University constituents.

Undergraduate vocational study programme in Electrical Engineering conforms with the development guidelines of the Faculty, as well as mission, vision and strategic goals defined in the FESB Development Strategy for the period 2012 – 2016, and is the only programme of this type at the University of Split and the wider region.

The proposed study programme conforms with the strategic document Network of Higher Education Institutions and Study Programmes in the Republic of Croatia, which encourages launching new study programmes in STEM area, as electrical engineering is one of STEM disciplinary program areas.

#### 1.9. Current experiences in equivalent or similar study programmes

FESB has extensive experience in delivering courses at similar programmes. Faculty of Electrical Engineering in Split was established in 1960, implementing a 2<sup>nd</sup> level study programme in electrical engineering, with programme duration of 8 semesters. After the integration with the studies in mechanical engineering and naval architecture, the Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture (FESB) was established in 1971. Since 1974 the Faculty has been a constituent part of the University of Split.

Continuous work at developing the curricula resulted in establishing a number of study programmes at undergraduate and graduate level. At the undergraduate study programmes in Electrical Engineering the programme is implemented in the following fields of study: Power Engineering and Electronic Engineering. The first three semesters of the study programme are identical for both fields of study, and the following semesters provide specialist courses with elective disciplines of study. The disciplines of study in Power Engineering are: Electric Drives and Facilities and Power Engineering Systems, and in Electronic Engineering: Automation and Systems, Electronic Communication Systems, Applied Electronic Engineering and Computer Technology.

In 1979 vocational study programmes were established at the Faculty (former level VI study programme) which are implemented since, with a pause during years 1998-2001.

Postgraduate study in the scientific field of electrical engineering was implemented at the Faculty, providing specialisation in the areas of telecommunications and computer information systems, electronics, power engineering and electromechanical engineering, automation and computing.

### **2.** DESCRIPTION OF THE STUDY PROGRAMME

#### 2.1. General information

Scientific/artistic area of the study programme	Engineering sciences
Duration of the study programme	3 years
The minimum number of ECTS required for completion of study	180
Enrolment requirements and admission procedure	Completed 4-year high school programme and state graduation exam. Rankings are formed based on the grade point average achieved in high school and the state exam results in the fields of mathematics and physics. Students of related undergraduate studies may also be admitted, with at least 30 ECTS credit recognition.

# 2.2. Learning outcomes of the study programme (name 15-30 learning outcomes)

The learning outcomes of the study programme are directly related to the learning outcomes of an individual course and represent learning outcomes to be achieved by each student who completes the undergraduate vocational study programme in *Electrical Engineering*. The learning outcomes are aligned with the Croatian Qualification Framework Act and are listed as common learning outcomes for both fields of study and additional learning outcomes depending on the selected field of study, in the areas of knowledge, skills and corresponding independence and responsibility.

#### KNOWLEDGE

- 1. To apply appropriate mathematical, physical and engineering principles in solving practical problems in the field of electrical engineering.
- 2. To apply appropriate analytical methods in presenting and solving highly complex electrical networks.
- 3. To consolidate the theoretical knowledge and practical skills in solving problems in the field of electrical engineering.
- 4. To recognise the possibilities and limitations of applied techniques and methods.

#### SKILLS

- 5. To apply the techniques, skills and advanced engineering tools necessary in the engineering work.
- 6. To conduct experiments and measurements in laboratory and industrial facilities, using state-of-the-art measuring devices.
- 7. To analyse collected data and measurement results from laboratories and industrial facilities.
- 8. To apply the knowledge of engineering and skills of effective problem solving of engineering problems, both independently and as a part of team.
- 9. To prepare design documents and technical reports, using modern technologies.
- 10. To participate in the work of multidisciplinary and international teams.
- 11. To use the literature, databases and other sources of information.
- 12. To give public oral presentation, to prepare written reports and present project results, in Croatian and English language.

#### INDEPENDENCE

- 13. To manage projects in the area of electrical engineering, from the preparation stage to completion.
- 14. To adapt to new techniques and technologies.
- 15. To work in the field under unforeseen conditions.

#### RESPONSIBILITY

- 16. To demonstrate awareness of the influences of engineering practice on the individual, society and environment.
- 17. To demonstrate professional and ethical responsibility in unforeseen conditions.
- 18. To demonstrate awareness on health, safety and legal issues related to the individuals and social groups.
- 19. To recognise the need for participating in life-long learning and acquiring the knowledge about new technologies.

ADDITIONAL LEARNING OUTCOMES FOR THE FIELD OF STUDY ELECTRIC POWER ENGINEERING

- 1. To design creative solutions for development, design, implementation and analysis of power engineering components, electrical machines and power electronics devices.
- 2. To plan the development, production, testing, safety, maintenance and monitoring of power engineering systems, electrical machines and facilities.
- 3. To monitor the production and testing of electrical equipment, devices and facilities, in accordance with design solutions.
- 4. To calculate energy ratios in systems conventional and renewable energy sources systems.
- 5. To manage maintenance of electrical and industrial facilities.
- 6. To select electrical machines for electro-mechanic conversion of energy.
- 7. To select transformers, overhead lines and switching equipment for transmission and distribution of electrical power.

ADDITIONAL LEARNING OUTCOMES FOR THE FIELD OF STUDY ELECTRONICS

- 1. To design creative solutions for development, design, implementation and analysis of analogue and digital electronic components and units.
- 2. To model electro-mechanical systems.
- 3. To manage automated systems.
- 4. To apply various methods of signal processing with the aim of optimal information transfer in communication systems.
- 5. To select topology and elements required for implementation of communication networks.
- 6. To solve complex tasks of simulating linear and non-linear systems.
- 7. To prepare a business plan in the field of engineering entrepreneurship with all necessary technological, commercial and financial parameters.
- 8. To apply regulations in the area of company law in managing company activities.

#### 2.3. Employment possibilities

Following the completion of studies, the acquired knowledge enables the students to find employment in the industry, electric power industry, software and ICT companies, education, service industry, etc. There is virtually no working environment in which experts with completed undergraduate vocational degree in Electrical Engineering could not find employment and the labour market demand for this profile of experts are very high. This is especially relevant in this moment, with social and economic changes driving the development of new, small and medium technologically advanced enterprises that could serve as the new driving force for economic development. Graduates who complete the undergraduate vocational study programme in Electrical Engineering acquire the knowledge and skills necessary for work in various areas: power engineering, electromechanical engineering, automation, computing and ICT. Following the completion of studies, the students are capable of testing, maintenance, designing, monitoring and controlling of circuits and devices in production, automated, power engineering and ICT systems and the use of corresponding software tools and equipment. The demand for experts with these competences considerably exceeds the available number of educated experts in the region, Croatia and the world.

#### 2.4. Possibilities of continuing studies at a higher level

After completing the undergraduate vocational study programme in Electrical Engineering, graduates may continue their studies at the specialist graduate vocational study programme at the University Department of Professional Studies or at other HEI offering that level of education. After completing differential exams and acquiring additional ECTS credits, students may be admitted to a graduate university study programme at FESB.

# 2.5. Name lover level studies of the proposer or other institutions that qualify for admission to the proposed study

#### 2.6. Structure of the study

The study programme is structured per semesters, lasting 6 semesters, two in each academic year. Each semester corresponds to 30 ECTS credits. During the first year of the studies, the students acquire fundamental knowledge in mathematics and natural sciences and fundamental knowledge in electrical engineering and information technology and the programme is implemented jointly for all students of this undergraduate vocational study. When students enrol in the second year, they choose one of the following fields of study:

- Electrical power engineering and
- Electronics.

The final component of the study programme is preparing and defending the final thesis. The conditions for enrolling a course are listed in the course table. Lectures are delivered in groups up to 100 students, auditory exercises and seminars in groups of 30 students and laboratory exercises in groups of 10 students.

#### 2.7. Guiding and tutoring through the study system

During the course of study programme activities, students have access to all the Faculty services. For the purpose of timely and effective communication, notifications and information are provided to students through the e-learning portal.

#### 2.8. List of courses that the student can take in other study programmes

Students may enrol courses from other study programmes only as elective courses which are not included in the standard workload of 30 ECTS credits per semester.

#### 2.9. List of courses offered in a foreign language as well (name which language)

Course tables for individual courses list the option of teaching a course in a foreign language.

#### 2.10. Criteria and conditions for transferring the ECTS credits

Transfer or recognition of ECTS credits between related university or vocational study programmes is allowed. The criteria and conditions for transferring the ECTS credits are regulated by the *Regulations on Studies and Study System at the University of Split*.

#### 2.11. Completion of study

Final requirement for completion of study	Final thesis⊠Diploma thesis□	Final exam □ Diploma exam □					
Requirements for final/diploma thesis or final/diploma/exam	The requirement for applying for the final thesis is acquired 120 ECTS credits.						
Procedure of evaluation of final/diploma exam and evaluation and defence of final/diploma thesis	The final thesis is evaluated by the mentor (supervisor) and the defence of the final thesis is conducted orally, in the presence of the mentor and students who also defend their final thesis with the same mentor.						

### 2.12. List of mandatory and elective courses

List of courses												
Year of study: 1.												
Semester: I.												
STATUS	CODE	COURSE	НО	URS	IN SEI	MEST	ER	ECTS				
STATUS	CODE	COURSE	L	S	AE	LE	DE	ECIS				
	FEMY03	Mathematics	45	0	45	0	0	7				
	FEMO01	Physics	30	0	15	15	0	5				
	FESY01	Introduction to Computer Applications	30	0	0	30	0	5				
	FENO01	Fundamentals of Electrical Engineering 1	45	0	30	15	0	7				
Mandatory	FELO01	Electrotechnical Materials and Technologies	30	0	0	15	0	4				
	FEOO02	English Language 1	0	30	0	0	0	2				
	Total		180	30	90	75	0	30				
	L = lectures	s, S = seminars, AE = auditory excercise, LE = labora	tory exc	ercise,	DE = 0	design	excerci	se				
	No electiv	e courses										

List of courses												
Year of study: 1.												
Semester: II.												
OTATUO			НО	URS	IN SE	MEST	ER	FOTO				
STATUS	CODE	COURSE	L	S	AE	LE	DE	ECIS				
	FEMY02	Applied Mathematics	30	0	30	0	0	5				
	FELO02	Introduction to Programming	30	0	0	30	0	5				
	FENO28	Fundamentals of Electrical Engineering 2	30	0	30	15	0	6				
Mandatory	FELO42	Electronic Devices	30	0	30	15	0	6				
Manualory	FENO24	Electrical Measurements	30	0	0	30	0	5				
	FEOO03	English Language 2	0	30	0	0	0	3				
	Total		150	30	90	90	0	30				
	L = lectures	s, S = seminars, AE = auditory excercise, LE = labora	tory exc	ercise,	DE = (	design	excerci	se				
	No electiv	re courses										

#### Modul A

List of courses											
Year of study: 2.											
Semester: III.											
OT ATUS	CODE	COURSE	НО	URS	IN SE	MEST	ER	ECTS			
31A103	CODE	COURSE	L	S	AE	LE	DE	ECIS			
	FENO04	Electrical Machines and Transformers	45	0	30	15	0	8			
	FENO05	Electrical Networks	30	0	15	15	0	5			
	FENO06	Electrical Power Switchgears	45	0	15	15	0	6			
Mandatory	FENO07	Power Electronics	45	0	0	30	0	6			
	FENO08	Control Engineering	30	0	15	15	0	5			
	Total		195	0	75	90	0	30			
	L = lectures	s, S = seminars, AE = auditory excercise, LE = labora	tory exc	ercise,	DE = 0	design	excerci	se			
	No electiv	re courses									

List of courses												
Year of study: 2.												
Semester: IV.												
OTATUO	CODE		НО	URS	IN SE	MEST	ER	LOTO				
31A103	CODE	COURSE	L	S	AE	LE	DE	ECIS				
	FENO09	Electrical Drives	30	0	15	15	0	5				
	FENO10	Electrical Installations	30	0	0	30	0	5				
	FENO11	Measurements in Power System	30	0	0	30	0	5				
Mandatawa	FENO12	Electrical Distribution Networks	30	0	15	15	0	5				
Mandatory	FENO13	Application of Industrial Computers	30	0	0	30	0	5				
	FENO14	Protection and Control Systems in Substation	30	0	15	15	0	5				
	Total		180	0	45	135	0	30				
	L = lectures	s, S = seminars, AE = auditory excercise, LE = labora	tory exc	ercise,	DE = 0	design	excerci	se				
	No electiv	e courses										

List of courses													
Year of study	Year of study: 3.												
Semester: V.													
07.17.10			HO	URSI	N SEI	MEST	ER	ГОТО					
STATUS	CODE	COURSE	L	S	AE	LE	DE	ECIS					
	FENO15	Electrical Safety	30	0	0	30	0	5					
	FENO16	Measurements of Process Quantities	30	0	0	30	0	5					
	FENO18	Maintenance and Testing of Electrical Power Equipment	30	0	0	30	0	5					
Mandatory	FENO21	Electronic Converters for Power Supplies	30	0	15	15	0	5					
		Elective Course 1*.											
		Elective Course 2*.											
	Total		120	0	15	105	0	20					
	FENO25	Design of Low Voltage Facilities	15	0	0	45	0	5					
Elective*	FENO29	Renewable Energy Sources	30	0	0	30	0	5					
Elective	FENO26	Marine Electrical Engineering	30	0	0	30	0	5					
	FENO20	Protection at Substations	30	0	15	15	0	5					
	L = lectures	s, S = seminars, AE = auditory excercise, LE = labor	atory exc	cercise	, DE =	design	excerci	se					
	* Two ele	ctive courses are selected.											

List of courses												
Year of study: 3.												
Semester: VI.												
OTATUO	CODE		НО	URSI	N SEI	MEST	ER	LOTO				
STATUS	CODE	COURSE	L	S	AE	LE	DE	ECIS				
	FEYY03	Professional Training						10				
		Elective Course 1*.										
Mandatory		Elective Course 2*.										
	FEYY01	Final Thesis						10				
	Total						20					
	FENO17	Control of Electrical Drives	30	0	0	30	0	5				
	FENO19	High Voltage Engineering	30	0	15	15	0	5				
Elective*	FENO22	Power System and Environment	30	0	0	30	0	5				
Elective	FENO23	Energy Sources	30	0	0	30	0	5				
	FENO31	Instrumentation for Smart Grid	30	0	0	30	0	5				
	FENO30	Microprocessors	30	0	0	30	0	5				
	L = lectures	, S = seminars, AE = auditory excercise, LE = labor	atory exc	ercise,	, DE =	design	excerci	se				
	* Two ele	ective courses are selected.										

#### Modul B

	List of courses							
Year of study	: 2.							
Semester: III	Semester: III.							
STATUS	CODE	COURSE	HO	URSI	N SEN	<b>NEST</b>	ER	ECTS
317103	CODE	COURSE	L	S	AE	LE	DE	
	FELO04	Electronic Circuits	45	0	45	30	0	9
	FELO05	Signals and Systems	45	0	15	15	0	6
Mandatory	FELO06	Automation	45	0	30	15	0	8
Warractory	FESY03	Introduction to Entrepreneurship	30	0	15	0	0	3
	FELO07	Fundamentals of Optoelectronics	30	0	0	15	0	4
	Total 195 0 105 75 0						0	30
	L = lectures	s, S = seminars, AE = auditory excercise, LE = labora	atory exc	ercise,	, DE = (	design	excerci	se
	No electi	No elective courses						

	List of courses								
Year of study	Year of study: 2.								
Semester: I	V.								
OTATUO	CODE	COURSE	HO	ГОТО					
STATUS	CODE	COURSE	L	S	AE	LE	DE	ECIS	
	FELO10	Communication Systems	45	0	30	15	0	8	
	FELO11	Digital Techniques	45	0	30	15	0	7	
Mandatory	FELO27	Electronic Cad	30	0	0	30	0	5	
Manualory		Elective Course 1.							
		Elective Course 2.							
	Total			0	45	75	0	20	
	FELO12	Process Control	30	0	15	15	0	5	
	FELO29	Elements of Robotics	30	0	0	30	0	5	
Elective*	FELP08	Computer Networks	30	0	15	15	0	5	
	FELO16	Antennas	30	0	15	15	0	5	
	FELO19	30	0	0	30	0	5		
	L = lectures	, S = seminars, AE = auditory excercise, LE = labor	atory exc	ercise,	DE = (	design	excerci	se	
	Two elective courses are selected.								

List of courses								
Year of study	: 3.							
Semester: V	1.							
OTATUO			НО	URS I	N SEN	VEST	ER	готе
STATUS	CODE		L	S	AE	LE	DE	ECIS
		Elective PRAKTIKUM 1						
		Elective PRAKTIKUM 2						
		Elective Course 1.						
Mandatory		Elective Course 2.						
		Elective Course 3.						
		Elective Course 4.						
	Total							
		Elective PRAKTIKUM						
	FELO44	Biomechanics Practicum	15	0	0	45	0	5
	FELO33	Practicum in Digital Image Processing	15	0	0	45	0	5
	FELO48	Mechatronics Practicals	15	0	0	45	0	5
	FELO46 Practicum in Electromagnetic Simulations		15	0	0	45	0	5
		Elective Course						
	FELO47	Electronic Circuits Design	15	0	15	30	0	5
	FELO20	Electronic Instrumentation	15	0	0	45	0	5
Elective	FELO21	Electromagnetic Compatibility	30	0	0	30	0	5
	FELO22	Computer Architectures	30	0	0	30	0	5
	FELO23	Modelling and Simulation	30	0	0	30	0	5
	FELP16	Computer and Data Security	30	0	0	30	0	5
	FELP17	Designing and Using Computer Networks	30	0	0	30	0	5
	FELO18 Control System Design				0	30	0	5
FELO30 Radio Communications				0	0	30	0	5
	FELO31	Computer Aided Analysis of Radiating Structures	30	0	0	30	0	5
	FELO32Human Exposure to Electromagnetic Radiation300030						0	5
	L = lectures	s, S = seminars, AE = auditory excercise, LE = labora	atory exc	cercise	, DE = 0	design	excerci	se
	Two elective praktikum and four elective courses are selected							

	List of courses								
Year of study	: 3.								
Semester: V	/I.								
0747110	0005	0011005		HOURS IN SEMESTER					
STATUS	CODE	COURSE	L	S	AE	LE	DE	ECIS	
	FEEE14	Commercial Law	30	0	0	0	0	2	
	FEYY03	Professional Training						10	
Elective		Elective Course 1.							
		Elective Course 2.							
	FEYY01	Final Thesis						10	
Total			30	0	0	0	0	22	
	FELO35 Internet Programming		30	0	0	15	0	4	
	FELO36	Sensors and Transducers	30	0	0	15	0	4	
	FELO37	Mobile Communication Networks	30	0	0	15	0	4	
	FELO45	Optical Communications	30	0	0	15	0	4	
Elective*	FETO01	Hydraulic and pneumatic systems	30	0	0	15	0	4	
	FELO39	Microcontrollers and embedded network systems	30	0	0	15	0	4	
FELO40		Maritime Radiocommunications	30	0	0	15	0	4	
	FELO41	High-Frequency Electronics	30	0	0	15	0	4	
	L = lectures	s, S = seminars, AE = auditory excercise, LE = labora	atory exc	ercise,	DE =	design	excerci	se	
	Three ele	ctive courses are selected.							

### 2.13. Course description

NAME OF THE COURSE	ANTENNAS						
Code	FELO16	Year of study	2.				
Course teacher	Prof. dr. sc. Antonio Šarolić	Credits (ECTS)	5				
				S	ΔE	IF	DE
Associate teachers	Anđela Matković, mag. ing. el.	I ype of instruction (number of hours)	30	0		30	
Status of the course	elective	Percentage of application of e- learning	0				
	COURSE DE	SCRIPTION					
Course objectives	Training students for: - understanding the phenom - analysis of antennas as rac - application of antennas in v	ena of radiation diating structures vireless communicatio	on syste	ems			
Course enrolment requirements and entry competences required for the course	None.						
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<ul> <li>utilize the antenna parameters as the basis for antenna application in ICT</li> <li>elaborately assess the applicability of a certain antenna for specific purpose</li> <li>calculate the electromagnetic field in the surrounding of simple antenna structures</li> <li>analyze the parameters of linear antennas</li> <li>analyze simple uniform antenna arrays</li> </ul>						
	Course content				_ or S	/ /	AE ours
	Introduction. Antenna paramete pattern.	ers. Polarization. Rad	iation		2		
	Directivity. Gain. Antenna impe	dance. Effective area	•		2		
	Effective length. Antenna factor parameters. Friis equation.	r. Relations linking the	e antenr	na	2		
	Elementary electrical dipole (El	ED). Field around the	EED.		2		
	Radiated power and radiation re	esistance of EED. Eff	iciency	of	2		
	Zones surrounding the antenna	- near and far field.			2		
Course content	Resonant dipoles. Halfwave dip	oles. Fullwave dipole	es.		2		
broken down in	Electrically short dipole and uni	pole.			2		
detail by weekly	Mutual impedance of dipoles.				2		
class schedule	Antenna array. Uniform linear a	intenna array.			2		
(syllabus)	Wideband antennas.				2		
	Overview of antennas w.r.t. free communication system.	quency and wireless			2		
	Practical examples of antenna	installations in use – t	field trip		2		
	List of laboratory or design exercises						or DE ours
	Link budget calculation, practica	al meaning of quantition	es used	in Frii	S		2
	Computer simulations of antenn	as using different sof	tware p	ackag	es for		4
	Computer simulations of antenn electromagnetic simulations – ir	as using different sof	tware parts	ackag und	es for		4

	Computer simulation	s of ante	ennas usi	ing differer	nt soft	ware package	s for	4
	Computer simulation	s of ante	enna arra	iys – gain,	radiat	tion pattern		4
	Computer simulation	s of refl	ector ante	ennas		•		4
	Practical examples o	of antenr	na installa	itions				4
Format of instruction	<ul> <li>☑ lectures</li> <li>□ seminars and wo</li> <li>☑ exercises</li> <li>□ on line in entirety</li> <li>□ partial e-learning</li> <li>☑ field work</li> </ul>	rkshops		<ul> <li>☑ indepe</li> <li>□ multim</li> <li>☑ laborat</li> <li>□ work w</li> <li>□</li> </ul>	endent nedia tory vith me (other	assignments entor r)		
Student responsibilities	Student is required t least 70% of the sch the amount of 100% laboratory exercises	udent is required to attend the lectures and auditory exercises in the amount of at ist 70% of the schedule. Student is required to attend the laboratory exercises in amount of 100% of the schedule and to complete all tasks associated with poratory exercises.						
Screening student work (name the	Class attendance	2	Researc	h	I	Practical traini	0,5	
proportion of ECTS	Experimental work	0,5	Report La		Laboratory exe	ercises	1	
activity so that the	Essay		Seminar essay		Individual work	(		
ECTS credits is	Mid-exam	0,5	5 Oral exam		(Other)			
value of the course)	Written exam	n exam 0,5 Project			(Other)			
Grading and evaluating student work in class and at the final exam	During the semester semester. To pass exam consists of sev part to pass the exam The student is requ admitted to the seco At the first exam ter half of the material th At all other exam tern material, regardless The overall point per of points earned in a Percentage -> Grad 50% - 62,4% -> suff 62,5% - 74,9% -> go 75% - 87,4% -> very 87,5% - 100% -> ex Final grade can be s agreement with the Exam terms: accord	During the semester, two mid-exams will be held, at the middle and at the end of the semester. To pass at each mid-exam, min. 50% of points must be earned. If the exam consists of several distinct parts, min. 50% of points must be earned from each part to pass the exam. The student is required to earn at least 30% of points at the first mid-exam to be admitted to the second mid-exam. At the first exam term, students may choose to take the exam containing only that half of the material that they haven't passed at mid-exams. At all other exam terms, students must take the whole exam, containing all the course material, regardless of the mid-exam results. The overall point percentage defining the overall grade is calculated as the average of points earned in all exam questions, corrected by the result of oral verification: Percentage -> Grade 50% - 62,4% -> sufficient (2) 62,5% - 74,9% -> good (3) 75% - 87,4% -> very good (4) 87,5% - 100% -> excellent (5) Final grade can be supplemented or entirely earned by the seminar work, subject to agreement with the teacher.						
Required literature (available in the	TitleNumber of copies in the libraryAva oth					Availa othe	ıbility via r media	
library and via other media)	2001.	raulosu	islavi, Gla	apinis, zag	lien			
	Constantine A. Bala and Design, Wiley, 1	nis: Ante 1997.	enna The	ory: Analy	vsis			
Optional literature (at the time of submission of study	<ul> <li>Juraj Bartolić: Mikrovalna elektronika, Graphis, Zagreb, 2011.</li> <li>Handbook of antennas in wireless communications, CRC Press, 2002.</li> </ul>							

programme	
Quality assurance methods that ensure the acquisition of	Surveys providing student feedback
Other (as the proposer wishes to add)	

NAME OF THE COURSE	APPLICATION OF INDUSTRIAL COMPUTERS							
Code	FENO13	Year of study	2					
Course teacher	Ozren Bego, Ph.D., Associate Professor	Credits (ECTS)	5					
Associate teachers	Danijel Jolevski, Ph.D., Assistant Professor	Type of instruction (number of hours)	L 30	S 0	AE 0	LE 30	DE 0	
Status of the course	Obligatory	Percentage of application of e-learning	0					
	COURSE	E DESCRIPTION						
Course objectives	Training students for: - understanding terms a - understanding working sensors and actuators, - programing PLCs.	nd concept of industrial au principles of programable	itomatic logic c	on, ontro	llers (F	LC),		
Course enrolment requirements and entry competences required for the course	None.							
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	Students will be able to: - define and describe au - select sensors accordin - analyze pneumatic and - program PLC.	tudents will be able to: define and describe automation system, select sensors according to defined criteria, analyze pneumatic and hydraulic actuators in automation system, program PLC.						
Course content					L or S hours	/ hc	λE burs	
	Introduction in course. Bas Technical process definitio Historical overview of autor automation: hydro power p	s.	2					
	Differences in machine and decentral control structure. computers. Redundancy.	al	2					
	Process computer structure peripherals. Process signa		2					
	Signal processing (multiple convertors, ADC types. Dig		2					
Course content broken down in	Sensors – types, static and digital and analog signals, suppression.	d dynamic characteristics, galvanic isolation, noise	transfer	of	2			
class schedule	Proximity sensors (mechar Linear and rotate movement	nical, inductive, capacitive, nt and speed measuremer	optical nt.	).	2			
(Synabas)	Temperature, pressure, flo	w and level measurement.			2			
	First midterm exam	nachanical actuatora, atan	motoro		2	-		
	Preumatic actuators Hydr	aulic actuators	motors		2			
	Introduction in PLC program blocks in PLCs. Functions data) Method of calling	mming. Program structure of blocks (organization, fu blocks. Binary arithmetic.	and nction,		2			
	Conversion and data transi instructions. Integer and flo Float point format. Counter	fer instructions. Jump and pat point arithmetic instruct	call tions.		2			
	Serial and parallel data transtandards RS 232 and RS access technique. Modbus	Serial and parallel data transfer. Industrial communication standards RS 232 and RS 485. Network topology. Network access technique. Modbus protocol.						
	Second midterm exam		2					

	List of laboratory or	st of laboratory or design exercises						LE or DE hours
	Introduction in LOGC	)! progra	amable re	elay.				3
	Programing LOGO!	<u> </u>						3
	Programing PLC – bi	inary ins	structions	, timers	, counte	rs, data convei	sions	3
	Programing PLC – a	nalog si	gnai mea	sureme	ents			<u> </u>
	Programing LOGOL	individ	ual assid	nments				8
		Individ	uui uooig					0
Format of instruction	<ul> <li>□ seminars and wor</li> <li>□ exercises</li> <li>□ on line in entirety</li> <li>□ partial e-learning</li> </ul>	kshops		⊠ inde □ mult ⊠ labo □ worł	pendent imedia oratory < with me	t assignments entor		
	☐ field work				(othe	r)		
Student responsibilities								
Screening student	Class attendance	ance 1 Research Practical training						
proportion of ECTS	Experimental work		Report			Laboratory atte	endanc	ce 1
activity so that the	Essay		Semina essay	ŕ		Independent work		2.2
ECTS credits is	Tests	0.2	Oral exa	am		Preparation for laboratory work		0.5
value of the course)	Written exam	ritten exam 0.1 Project (Other)						
Grading and evaluating student work in class and at the final exam	<ul> <li>There are two midterms and final exams. The first midterm exam is after 7 weeks of lecturing and the second one is after the next 6 weeks. Each midterm and final test consists of 10 questions. In the final exams students that did not pass the midterm exams take part. The requirement for passing grade is the positive assessment of laboratory exercises and 50 % points on each midterm exam or the final exam. Grade (in percentage) is formed according to the formula: Grade(%) = 0,05 NP + 0,35 LV + 0,3 (M1 + M2)</li> <li>the activities in percentage:</li> <li>NP - attendance at lectures,</li> <li>LV – laboratory assessment (independent/group work),</li> </ul>							
Required literature (available in the		Title	•			Number of copies in the library	Avail othe	ability via er media
media)	O. Bego: Predavanja procesnih računala,	a iz prec FESB	lmeta Pri	mjena			e-le F	earning oortal
Optional literature (at the time of submission of study programme proposal)	-							
Quality assurance methods that ensure the acquisition of exit competences	<ul> <li>Evaluation c</li> <li>Feedback fr</li> <li>Self-evaluat</li> <li>Institutional</li> </ul>	<ul> <li>Evaluation of results in accordance with the above learning outcomes</li> <li>Feedback from students via surveys</li> <li>Self-evaluation of teachers,</li> <li>Institutional and non-institutional evaluations</li> </ul>						
Other (as the proposer wishes to add)								

NAME OF THE COURSE	APPLIED MATHEMATICS								
Code	FEMY02	Year of study	1						
Course teacher	Ivančica Mirošević, M.Sc., Lectuter	Credits (ECTS)	5						
Associate teachers	Lea Dujić	Type of instruction (number of hours)	L 30	S	AE 30	LE	DE		
Status of the course	obligatory	Percentage of application of e-learning	10						
	COURSE	DESCRIPTION							
Course objectives	<ul> <li>application of mathematical concepts and tools from the area of ordinary differential equations, numerical mathematics, statistics and probability to analyze and solve engineering problems.</li> </ul>								
Course enrolment requirements and entry competences required for the course	Good knowledge of Hig Mathematics.	ood knowledge of High School mathematics and passed State Exam in athematics.							
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	Students will be able to: - state definitions and t - illustrate theorems wi - solve some first and s - apply Laplace transfo - find approximate solu - approximate function - approximate empirica - solve definite integral - use statistical techniq - find probability distribute	<ul> <li>state definitions and theorems from the enitre course,</li> <li>illustrate theorems with examples,</li> <li>solve some first and second order differential equations,</li> <li>apply Laplace transform to linear differential equations</li> <li>find approximate solution of a nonlinear equation</li> <li>approximate function with Lagrange interpolation polynomial</li> <li>approximate empirical data with constant, linear or quadratic function</li> <li>solve definite integral and Cauchy problem of the first order approximately</li> <li>use statistical techniques in data analysis</li> <li>find probability distributions of random variables in random experiments</li> </ul>							
	Course content	tial Equational Dasis con	anta a	   	_ or S hours	/ hc	AE ours		
	definitions. Equations with	tial	2		2				
	equations of the first order.			2		2			
	equations of the second on	der with constant coefficie	nts.		2		2		
	Laplace transform and bas	ic properties.		se	2		2		
Course content broken down in	coefficients using Laplace t	transform.	nonline		2		2		
detail by weekly class schedule	equations. Graphical me method.	thod. Bisection method.	Iterati	ve	2		2		
(syllabus)	7. Lagrange interpolation p	olynomial			2		2		
	8. Least square method. constant, linear or quadrati	Approximating empirical c function.	data w	rith	2		2		
	9. Numerical integration. Euler's method for Cauchy	Trapezoidal rule. Simps problems.	on's ru	lle.	2		2		
	10. Descriptive statistics. Numerical characteristics.	Discrete data and continu	ious da	ta.	2		2		
	11. Introduction to Probab Basics of Combinatorics.	bility theory. Elementary	outcom	es.	2		2		
	12. Discrete random va Binomial distribution. Poiss	riable. Expectation and on distribution.	varian	ce.	2		2		

	13. Continuous ran Normal distribution.	Continuous random variable. Expectation and variance. 2 2						
	List of laboratory or o	design e	exercises				LE or DE hours	
Format of instruction	<ul> <li>☑ lectures</li> <li>□ seminars and wor</li> <li>☑ exercises</li> <li>□ on line in entirety</li> <li>□ partial e-learning</li> <li>□ field work</li> </ul>	kshops		<ul> <li>☑ independe</li> <li>□ multimedia</li> <li>□ laboratory</li> <li>□ work with</li> <li>□ (otherwork)</li> </ul>	ent assignments a mentor ner)			
Student responsibilities	Regular attendence	to and a	active par	ticipation in le	ectures and e	xcercises		
Screening student	Class attendance	2	Researc	h	Practical tr	aining		
proportion of ECTS	Experimental work		Report		Self study		2.6	
activity so that the	Essay		Seminai essay	,	(Oth	ner)		
ECTS credits is	Tests	0.2	Oral exa	m	(Oth	ner)		
equal to the ECTS value of the course)	Written exam	0.2	0.2 Project		(Oth	ner)		
Grading and evaluating student work in class and at the final exam	During semester two weeks of lectures, a term exam students through assignemen course is minimum points. After semester, two Students which did r during final exams. Students which did comprehensive cour is 80. The condition and a total of at leas The grade is formed of FESB: 15% of the best stud next 35% students g and the last 15% stu Students who did no at least 10 points, ca number of points is points. Mid-term exa exam schedule.	During semester two mid-term exams are held. The first exam is scheduled after 7 veeks of lectures, and the second in the week following the lectures. At each mid- arm exam students can get 40 points, while the remaining 20 points are attained hrough assignements during lectures and excercises. The condition for passing the course is minimum 20 points on each mid-term exams and a total of at least 50 points. After semester, two final exams and a correction exam are held. Students which did not pass one mid-term exam, can take only this part of the exam luring final exams. Students which did not pass any mid-term exam, take the final exam with comprehensive course content. In that case, maximum numbers of available points as 80. The condition for passing the course is minimum 40 points in the final exam and a total of at least 50 points. The grade is formed after the second final exam according to article 75 of the Statute of FESB: 5% of the best students get the mark excellent (5), next 35% students get the mark very good (4), next 35% students get the mark sufficient (2). Students who did not pass the course after final exams, and have obtained total of at least 10 points, can attend the correction exam. On the correction exam maximal pumber of points is 100, and the minimum requirement for a passing grade is 50 points. Mid-term exams and correction exams are held according to the						
Required literature (available in the library and via other		Title	)		copies i the libra	n Avail ry oth	ability via er media	
media)	Lecture materials on	FESB	e-learnin	g portal.		https g.	://elearnin fesb.hr/	
Optional literature (at the time of submission of study	T. Bradić, J. Pečarić Element, Zagreb, 19 B. P. Demidovič: Zbi	<ul> <li>Bradić, J. Pečarić, R. Roki, M. Strunje: Matematika za tehnološke fakultete, lement, Zagreb, 1998.</li> <li>P. Demidovič: Zbirka zadataka iz više matematike, Školska knjiga, Zagreb 1998.</li> </ul>						

programme	Ivo Pavlić, Statisticka teorija i primjena, Zagreb, 1971
proposal)	
	- homework
Quality assurance	- short tests
methods that ensure	- quizzes
the acquisition of	- mid-term exams
exit competences	- final exam
	<ul> <li>student questionnaires</li> </ul>
Other (as the	
proposer wishes to	
add)	

NAME OF THE COURSE	AUTOMATION										
Code	FELO06	Year of study	2.								
Course teacher	Josip Musić, Ph.D., Assistant Professor	Credits (ECTS)	8								
Associate teachers	Ana Kuzmanić Skelin, Ph.D., Assistant Professor	Type of instruction (number of hours)	L 45	S 0	AE 30	LE 15	DE 0				
Status of the course	Obligatory	Percentage of application of e-learning	0								
COURSE DESCRIPTION											
Course objectives	<ul> <li>Training students for:</li> <li>understanding basic pr control systems.</li> <li>application of acquired analysis in time and in</li> </ul>	<ul> <li>I raining students for:</li> <li>understanding basic principles and laws in the area of analysis of automatic control systems.</li> <li>application of acquired knowledge on solving basic problems of system analysis in time and in frequency domains.</li> </ul>									
Course enrolment requirements and entry competences required for the course	None										
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<ul> <li>Students will be able to:</li> <li>define the fundamental phenomena, the quantities and the laws for automatic control systems.</li> <li>apply fundamental laws of electrical engineering and mechanics for modelling. electro-mechanical systems (and their analogies).</li> <li>apply (inverse) Laplace transform for solving differential equations.</li> <li>solve for system's time response for given input function.</li> <li>apply block algebra for calculation of transfer function of a complex systems.</li> <li>sketch Bode and Nyquist diagrams.</li> <li>analyze system stability in time and frequency domain.</li> <li>analyze sensitivity and accuracy of a given system.</li> </ul>										
	Course content				or S	h h	AE ours				
	Introduction. Automation. C synthesis of control system	Control and regulation. Ana	alysis ar	nd	3		2				
	Mathematical description of dynamical systems. System description with differential equations, classical solution. System analysis in time domain. Transition function. Time response of basic systems.						2				
Course content	Analysis in complex domain transformation and operato transformation.	on	3		2						
broken down in detail by weekly	Solving differential equation Transfer function.	ns using Laplace transforn	nation.		3		2				
class schedule	Block algebra.	oin Dinus transfer for atte			3		2				
(syliadus)	Analysis in frequency doma Frequency response.	ain. Sinus transfer function	l.		3		2				
	Graphical depiction of frequencies systems.	uency response: Bode plot	is of ba:	SIC	3		2				
	Graphical depiction of frequencies	uency response: Nyquist d	lagram	·  -	3		2				
	System stability analysis: N	and Bode criteria.			3		2				
	System stability analysis: H System accuracy analysis,	steady state errors. Sensi	tivity		3 3		∠ 2				
	analysis. Electro-mechanical analogi	ios			3		2				
	System analysis via model	ling on digital computer.			3		2				
		5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5			-						

	List of laboratory or design exercises									
System analysis in time domain.										
	First order system analysis.									
	Second order system	n analys	is.				2			
	Steady state error.						2			
	System analysis in fr	equenc	y domain				2			
	Stability analysis.						2			
	Sensitivity analysis.						2			
	System modelling on	digital	computer				1			
	☑ lectures			□ inde	nondon	t assignments				
	seminars and wor	kshops			imodia	a assignments				
Format of instruction	⊠ exercises			⊠ Inuit						
Format of instruction	□ <i>on line</i> in entirety				ratory					
	□ partial e-learning				c with m	ientor				
	☐ field work				(othe	er)				
Student	The presence on lec	tures in	the amo	unt of a	t least 7	0 % of the times sche	duled.			
responsibilities	Performed all require	ed labor	atory exe	ercises.						
Screening student	Class attendance	3	Researc	h		Practical training				
proportion of ECTS	Experimental work		Report			Individual work	3,5			
activity so that the	Essay		Semina essay	r		Laboratory exercises	0,7			
ECTS credits is	Tests	0,3	Oral exa	al exam Preparation for laboratory exercise		Preparation for laboratory exercises	0,3			
value of the course)	Written exam	0,2	Project			(Other)				
Grading and evaluating student work in class and at the final exam	weeks of lectures an test (as well as the minutes. It consists of exams students that consists of 8 theore passing grade is the average midterm ex from theoretical and 45% of total points of at least 50% of total Grade (in percentag Grade(%) = 0,25L + where: • L – laborato • M1, M2 – m Final grade (based of Percentage G 50% do 62% suf 63% do 74% goo 75% do 86% ver	During the semester there are two midterm exams. The first midterm exam is after 7 weeks of lectures and the second one is after 13 weeks of lectures. Each midterm test (as well as the final test) is carried out in a written format with duration of 90 minutes. It consists of both theoretical questions and numerical problems. In the final exams students that did not pass the midterm exams take part. The final exam test consists of 8 theoretical questions and numerical problems. The requirement for passing grade is the positive assessment of laboratory exercises and 50 % points on average midterm exam ((M1 + M2)/2) or the final exam (with at least 25% of points from theoretical and numerical problems each). Students are allowed to have at least 45% of total points on each midterm exams, as long as the final midterm average is at least 50% of total points. Grade (in percentage) is formed according to the formula: Grade(%) = 0,25L + 0,375(M1 + M2) where: • L – laboratory assessment, • M1, M2 – midterm test results. Final grade (based on percentages) is formed as follows: Percentage Grade 50% do 62% sufficient (2)								
	According to Article 65. of Faculty's Bylaw, student is required to participate in all teaching activities attending at least 70% of lectures, and 100% of laboratory exercises. In accordance with that student is required to solve and turn over for grading 100% of all laboratory exercises. If student does not meet these criteria. she									

	or he won't be able to take part in the final exam, and will be required to enroll in the							
	Title	Number of copies in the library	Availability via other media					
	Mandić, I.: Automatika, Liber, Zagreb, 1983.	2						
Required literature (available in the library and via other	Mandić I.: Zbirka zadataka sa repetitorijem iz linearnih dinamičkih sustava, FESB, interna skripta, Split, 1983.	1						
media)	V. Zanchi: Automatika, FESB, Split, 1989.	1						
	A. Kuzmanić Skelin, Guidelines for laboratory exercises, FESB		e-learning portal					
	V. Papić, J. Musić: Authorized lecture notes, FESB		é-learning portal					
Optional literature (at the time of submission of study programme proposal)	<ol> <li>Božičević, J. : Temelji automatike 1, Školska knjiga , Zagreb, 1989.</li> <li>Šurina, T.: Automatska regulacija, Školska knjiga, Zagreb, 1972.</li> <li>Marasović, J.: Temeljni postupci u automatici, Interna skripta, FESB, Split, 2001.</li> <li>Kuo. B.C.: Automatic Control System, Prentice Hall, Englewood Cliffs, New Jersey, 1995.</li> </ol>							
Quality assurance methods that ensure the acquisition of exit competences	<ul> <li>Keeping records of student attendance.</li> <li>Annual analysis of course statistics in terms of midterm and finals exams</li> <li>Evaluation of results in accordance with the above mentioned learning outcomes.</li> <li>Feedback from students via surveys.</li> <li>Feedback from graduated students (or senior students) on course content relevance.</li> <li>Self-evaluation of teachers.</li> </ul>							
Other (as the proposer wishes to add)	/							

NAME OF THE COURSE	BIOMECHANICS PRACTICUM									
Code	FELO44	Year of study	3.							
Course teacher	Josip Musić, Ph.D., Assistant Professor 5									
Associate teachers	Tea Marasović, PhD	Type of instruction (number of hours)	L 15	S 0	AE 0	LE 45	DE 0			
Status of the course	Elective	Percentage of application of e-learning	0	-	-		-			
	COURSE	E DESCRIPTION	<u>I</u>							
Course objectives	rse objectives Training students for: - understanding basic principles and terminology in the area of biomech - application of acquired knowledge on design and conduction of exper with emphasis on used measurement equipment.									
Course enrolment requirements and entry competences required for the course	None	None								
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<ul> <li>Students will be able to:</li> <li>recognize technical systems used in biomechanical measurements.</li> <li>calculate human anthropometric parameters.</li> <li>apply appropriate measurement equipment for human gait measurements, as well as ground reaction forces, EMG and range of movement measurements.</li> <li>analyze human gait kinematics.</li> <li>calculate forces and moments in human joints using inverse kinematics.</li> </ul>									
	Course content									
	Introduction to biomechanics; Overview of technical systems for measurement of human biomechanical parameters									
	Measurement methods and procedures in biomechanics.									
	Human anthropometric parameter identification.									
	Gait analysis: terminology and measurements. Human gait parameter measurements; Kinematics and Kinetics.									
	Position and balance of human body during the gait.									
	Ground reaction forces during the gait.									
	Electromyography, measur	ring muscle activity during	humar	n move	ment.		3			
Course content	Inverse kinematics for iden	tification of muscle activity	<i>'</i> .				2			
broken down in	Application of computer vis	ion in biomechanics.					1			
class schedule	List of laboratory or design	exercises				LE o ho	or DE ours			
	Introductory lecture on labo equipment as well as tasks	ratory protocols, available during laboratory exercise	meası es.	uremer	nt		4			
	Measurement of human ant method.	thropometric parameters v	ia finite	eleme	ent		5			
	Measurement of human gai	it parameters via fast came	eras.			6				
	Measurement of ground rea	action forces during the ga	it via fo	orce pla	ate.	<u> </u>	6			
	Measurement of EMG signa	als during the gait.	. L		h e -		6			
	Estimation of muscle activit on measured kinematic par comparison with measured	y and joint moments during ameters and ground react EMG signals.	g numa ion forc	an gait ces;	pasec		6			
	Measurement of range of motion of cervical spine via inertial sensor units.						6			

	Application of computer vision for classification and automatic translation 6							
Format of instruction	<ul> <li>☑ lectures</li> <li>□ seminars and workshops</li> <li>☑ exercises</li> <li>□ on line in entirety</li> <li>□ partial e-learning</li> <li>□ (othe</li> </ul>			nt assignments nentor er)				
Student responsibilities	The presence on lec Performed all require	tures in ed labor	the amo atory exe	unt of at least 7 prcises.	0 % of the time	es schedu	uled.	
Screening student	Class attendance	0,5	Researc	h	Practical traini	ng		
proportion of ECTS	Experimental work		Report		Individual work	<	2	
credits for each activity so that the	Essay		Seminal essay		Laboratory exe	ercises	2	
ECTS credits is	Tests	0,1	Oral exa	ım	Preparation fo laboratory exe	r rcises	0,3	
value of the course)	Written exam	0,1	Project		(Other)			
Grading and evaluating student work in class and at the final exam	<ul> <li>buring the semester weeks of lectures ar test (as well as the minutes. It consists of exams students that consists of 6 theore passing grade is the average midterm exa at least 40% of tota average is at least 5 Grade (in percentag</li> <li>Grade(%) = 0,5L + 0</li> <li>where: <ul> <li>L – laborator</li> <li>M1, M2 – mi</li> </ul> </li> <li>Final grade (based of Percentage G 50% do 62% suf 63% do 74% good 75% do 86% ver 87% do 100% excording to Article teaching activities a exercises. In accord grading 100% of all for he won't be able to course the next year</li> </ul>	Winten exam       0,1       Project       (Other)         During the semester there are two midterm exams. The first midterm exam is af weeks of lectures and the second one is after 13 weeks of lectures. Each mid est (as well as the final test) is carried out in a written format with duration or ninutes. It consists of both theoretical questions and numerical problems. In the exams students that did not pass the midterm exams take part. The final exam consists of 6 theoretical questions and numerical problems. The requirement passing grade is the positive assessment of laboratory exercises and 50 % point average midterm exam ((M1 + M2)/2) or the final exam. Students are allowed to I at least 40% of total points on each midterm exams, as long as the final mid average is at least 50% of total points.         Grade (in percentage) is formed according to the formula:         Grade(%) = 0,5L + 0,5(M1 + M2)         where:         L – laboratory assessment,         M1, M2 – midterm test results.         Final grade (based on percentages) is formed as follows:         Percentage       Grade         50% do 62%       sufficient (2)         33% do 74%       good (3)         75% do 86%       very good (4)         87% do 100%       excellent (5)         According to Article 65. of Faculty's Bylaw, student is required to participate leaching activities attending at least 70% of lectures, and 100% of laboratory exercises. In accordance with that student is required to solve and turn ove grading 100% of all laboratory exercises. If student does not meet these criteria						
Required literature		Title	)		copies in	Availab other	ility via media	
(available in the library and via other media)	Winter D.A.: The Bic of Human Gait, Univ Waterloo, 1991.	: The Biomechanics and Motor Control Gait, University of Waterloo Press, 991.				tead	cher	

	V. Zanchi, J. Musić: Biomehanika I dio, internal script, FESB, 2005.		teacher				
	V. Zanchi, V. Papić, T. Šupuk: Biomehanika II dio, internal script, FESB, 2005.		teacher				
	T. Marasović, Guidelines for laboratory exercises, FESB		e-learning portal				
	J. Musić: Authorized lecture notes, FESB		é-learning portal				
Optional literature (at the time of submission of study programme proposal)	<ol> <li>J. Perry: Gait Analysis: Normal and Pathological Function, Slack Inc. 1992</li> <li>R. J. Jagacinski, J. M. Flach: Control Theory for Humans: Quantitative Approaches to Modeling Performance, Lawrence Erlbaum Associates Inc., 2003</li> <li>Zanchi V., Cecić M., Grujić T., Kuzmanić A., Papić V. : Laboratory for Identification of Human Movement with LaBACS Software Support, International Congress on Computational Bioengineering, ICCB'03, 24-26 September 2003., Zaragas, Sprin, p. 455, 461</li> </ol>						
Quality assurance methods that ensure the acquisition of exit competences	<ul> <li>Keeping records of student attendance.</li> <li>Annual analysis of course statistics in terms of midterm and finals exams</li> <li>Feedback from students via surveys.</li> <li>Feedback from graduated students (or senior students) on course content relevance.</li> <li>Self-evaluation of teachers.</li> <li>Periodic institutional evolution of course teachers.</li> </ul>						
Other (as the proposer wishes to add)	/						

NAME OF THE COURSE	COMMERCIAL LAW										
Code	FEEE14	Year of s	tudy	3							
Course teacher	Zlatko Ćesić, Ph.D., Assistant Professor	Credits (E	ECTS)	2							
Associate teachers		Type of instruction (number of hours)			S	AE 0	LE	DE			
Status of the course	Obligatory	Percenta applicatio	ge of on of e-learning	0							
	COURSE DESCRIPTION										
Course objectives	Training students for: - specific business ta - participate in econo basis of modern economic	<ul> <li>Fraining students for:</li> <li>specific business tasks in corporate governance and work in companies</li> <li>participate in economic activities - primarily about trade agreements, as a basis of modern economic relations.</li> </ul>									
Course enrolment requirements and entry competences required for the course	None	None									
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<ul> <li>Students will be able to:</li> <li>define basic terms and legal sources of commercial contract law,</li> <li>interpret basic principles of commercial contract law,</li> <li>apply the rules that govern the contracting activities of traders,</li> <li>conclude commercial contracts with the use of instruments for contractual reinforcing the position of the parties,</li> <li>define the basic concepts of company law,</li> <li>apply regulations on the organization and functioning of company persons,</li> <li>apply regulations on the organization and functioning of joint stock companies,</li> <li>apply regulations on the organization and functioning of a limited liability company,</li> </ul>										
	Course content				l	_ or S nours	hc	AE ours			
	Introduction to Commercial Law. Demarcation of trade and other branches of law. History and legal sources of commercial law.					2		0			
Course content	The concept and the subject company. Legal and natural persons. Legal and business capacity.							0			
broken down in	Sole trader. Company. Cor	npany per	sons.			4	_	0			
detail by weekly	A limited liability company.					<u> </u>		0			
class schedule	Status changes Entrepren	eurial cont	racts			4 2		0			
(syllabus)	Commercial contract law. Term commercial contracts. Conclusion, amendment and cancellation of contracts. Interpretation of commercial contracts.					4		0			
	Commercial contract law - law.	special pa	rt. Some trade a	greem	ent	4		0			
	Right securities. Division of	f Securities	s. Traffic securiti	ies.		2		0			
	The basics of intellectual p	roperty rig	hts.			2					
	List of laboratory or design exercises							orde			
	x lectures		X independent	assian	mente		1				
Format of instruction	seminars and workshops	3		assigni	10110						
	□exercises	□laboratory									

	□ <i>on line</i> in entirety □		□work	with me	entor			
	□partial e-learning				(other	·)		
	□field work							
Student responsibilities	The presence on lect Performed all require	tures in ed labor	the amoratory exe	unt of at ercises.	t least 70	0 % of the time	es schedu	led.
Screening student	Class attendance	1	Researc	h		Practical tra	aining	0
proportion of ECTS	Experimental work		Report			Independ assignme	lent ents	0.2
activity so that the total number of	Essay		Seminai essay			(Other)		
ECTS credits is	Tests	0,4	Oral exa	ım		(Other)		
value of the course)	Written exam	0,4	Project			(Other)		
Grading and evaluating student work in class and at the final exam	There are two midterms and final exams. The first midterm exam is after 7 weeks of lecturing and the second one is after the next 6 weeks. Each midterm test consists of 10 theoretical questions and numerical problems and final tests consist of 20 theoretical questions and numerical problems. In the final exams students that did not pass the midterm exams take part. The midterm and final exams are carried out as written tests. The requirement for passing grade is the 50 % points on each midterm exam or the final exam. Grade (in percentage) is formed according to the formula: Grade(%) = 0,05 NP + 0,05 SR + 0,4 (M1 + M2) the activities in percentage: NP - attendance at lectures, SR - independent assignments							eeks of consists t of 20 that did ried out n each g to the
	Title			Number of copies in the library	Availabi other n	lity via nedia		
Required literature (available in the library and via other media)	Horak, H., Dumančić, K., Šafranko, Z., Preložnjak, B.: UVOD U TRGOVAČKO PRAVO, dostupno na linku: <u>http://www.fer.unizg.hr/_download/repository/Uvod_utrgovacko_pravo_1.pdf</u> Jurilj M Ćesić Z., Trgovačko ugovorno pravo – opći dio, Sveučilište u Mostaru, Mostar, 2009. Ćesić Z., Pravo trgovačkih društava, Knin, 2008.							
Optional literature (at the time of submission of study programme proposal)	Z. Ćesić - V. Gorenc RRiF, Zagreb, 2005. V. Gorenc - Z. Ćesić Zagreb, 2008.	: - H. Ka : - V. Bu	čer i dr., Ijan, Korr	Koment ientar Z	tar Zako Zakona o	na o obveznim • trgovačkim dr	odnosim uštvima, I	a, RRiF,
Quality assurance methods that ensure the acquisition of exit competences	<ul> <li>Evaluation of result</li> <li>Feedback from stress</li> <li>Self-evaluation of the stress</li> </ul>	Its in ac udents v teacher	cordance /ia survey s	e with th /s valuatio	ie above	e learning outco	omes	
Other (as the proposer wishes to add)								

NAME OF THE COURSE	COMMUNICATION SYSTEMS								
Code	FELO10	Year of study	2.						
Course teacher	Matko Šarić, Ph.D., Assstant Professor								
Associate teachers	Petar Šolić, Ph.D., Assstant Professor	Type of instruction	L	S	AE	LE	DE		
		Percentage of	45	0	30	15	0		
Status of the course	Obligatory	application of e-learning	0						
	COURSE	E DESCRIPTION							
Course objectives	<ul> <li>Training students for:</li> <li>The acquisition of basic theoretical knowledge of communication systems</li> <li>The adoption of practical knowledge about the most frequently used communication systems</li> </ul>								
Course enrolment requirements and entry competences required for the course	None	None							
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<ul> <li>Students will be able to:</li> <li>1. Define the model of the communication system and describe the properties of the signals in communications</li> <li>2. Define and explain the analog and digital modulations</li> <li>3. Describe the topology of communication networks</li> <li>4. Describe wideband access networks</li> </ul>								
	Course content		L hours	/ hc	\E ours				
	The history of communicati communication systems. T quality of service. Digital ar		3		2				
	OSI communication model. Basic characteristics of sig		3	2					
	Modulation. Amplitude mod modulation. Frequency mu		3		2				
	The frequency and phase r channel at the FM system.		3		2				
	The digital angle modulatio QPSK. QAM.		3		2				
Course content broken down in	Pulse Systems. Time multi Nonlinear quantization. A la		3		2				
detail by weekly class schedule	Line coding. Natural code. RZ code. AMI code. HDBN	<u>z</u> ,	3		2				
(syllabus)	First midterm exam								
	Decoding PCM signal. DPC	CM. DM.			3		2		
	Signal transmission throug Nyquist criteria. The correla	h real channels. Equalisati ation filter.	ion.		3		2		
	Equalization. The echo and scrambler. PN generator.	d echo cancellation. Scram	nbling a	nd	3	3 2			
	Clock synchronization and organization of the telecom	frame. The hierarchical munications networks.			3 2		2		
	Switching channels, messa element. Types of switchin	ages and packages. Switcl g elements.	ning		3		2		
	Access Technologies, a mo	obile wireless communicat	ions		3	1	2		
	Second midterm exam					1			
	List of laboratory exercises		LE	hours					
	The voice signal							2	
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	Spectrum of the FM	signal						2	
	FSK modulation							2	
	QPSK modulation							2	
	РСМ							2	
	⊠ lectures				1				
	□ seminars and wor	kshops			dent	assignments			
Format of instruction									
Format of Instruction	□ on line in entirety				ntor				
	□ partial e-learning				n ne othor	A A A A A A A A A A A A A A A A A A A			
	☐ field work	] field work							
Student responsibilities	The presence on lect Performed all require	tures in ed labor	the amo atory exe	unt of at lea ercises.	st 70	% of the time	s sche	duled.	
Screening student	Class attendance	Class attendance 3 Research				Practical trainir	ng		
proportion of ECTS	Experimental work		Report		I	ndividual work	(	3,7	
credits for each activity so that the total number of ECTS credits is equal to the ECTS	Essay		Seminai essay		L	aboratory exe	ercises	0,5	
	Tests	0.2	Oral exa	ım	F	Preparation for	ſ	0.5	
		0,_			li	aboratory exer	-,-		
value of the course)	Written exam	0,1	Project			(Other)			
Grading and evaluating student work in class and at the final exam	During the semester final exams consist pass the midterm ex The midterm and fir passing grade is the each midterm exam the formula: Grade (%) = $2/3 * (0$ M1, M2 - points at the laboratory (with com The final evaluation percentage Rating 50% to 61% is suffic 62% to 74% good (3) 75% to 87% of very 88% 100% Excellent	During the semester there are two mid-term exams and the final exam. Mid-term and final exams consist of questions and tasks. In the final exams students that did not pass the midterm exams take part. The midterm and final exams are carried out as written tests. The requirement for passing grade is the positive assessment of laboratory exercises and 50 % points on each midterm exam or the final exam. Grade (in percentage) is formed according to the formula: Grade (%) = $2/3 * (0.5 * M1 + 0,5 * M2) + 1/3 * L$ ; M1, M2 - points at the mid-term expressed as a percentage, and L - points from the laboratory (with completed all lab. Exercises) expressed as a percentage. The final evaluation is determined as follows: percentage Rating 50% to 61% is sufficient (2) 62% to 74% good (3) 75% to 87% of very good (4)							
Required literature		Title	•			copies in the library	Availa othe	ıbility via r media	
(available in the	L. W. Couch II: Digit	al and A	analog Co	ommunicatio	on				
media)	S Benedetto: Drinoi	ales of a	linital tran	emission: w	with				
	wireless application	0105 01 (	ingital traf	131111551011. V	WILLI				
	J. Proakis: Digital Co	ommuni	cation. IV	. Ed.					
Optional literature (at the time of submission of study programme proposal)									

Quality assurance methods that ensure the acquisition of exit competences	<ul> <li>Evaluation of results in accordance with the above learning outcomes</li> <li>Feedback from students via surveys</li> <li>Self-evaluation of teachers</li> <li>Institutional and non-institutional evaluations</li> </ul>
Other (as the proposer wishes to add)	

NAME OF THE COURSE	COMPUTER AIDED ANA	LYSIS OF RADIATING S	TRUCT	URES	5			
Code	FELO31	Year of study	3.					
Course teacher	Vicko Dorić, Ph.D., Associate Professor	Credits (ECTS)	5					
Associate teachers	Maja Škiljo, Ph.D.	Type of instruction (number of hours)	L 30	S 0	AE 0	LE 30	DE	
Status of the course	Elective	Percentage of application of e-learning	0					
	COURSE	E DESCRIPTION	•					
Course objectives	<ul> <li>I raining students for:         <ul> <li>understanding of basic principles and laws of electromagnetics,</li> <li>knowing basic terms and principles of antennas and EM waves propag</li> <li>using commercial software packages for wire antenna analysis.</li> <li>developing computer models of typical antenna systems</li> </ul> </li> </ul>							
Course enrolment requirements and entry competences required for the course	Mathematics, Fundamenta	Is of Electrical Engineering	g.					
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	Students will be able to: define the fundamental terms in electromagnetic theory, classify numerical methods for engineering problems, name and explain basic antenna parameters, recognize characteristic parameters of the radiation pattern, use software package SuzANA, use software package NEC.							
	Course content				L or S hours	/ hc	\E ours	
	Introduction. Electric field. differential form. Wave equ	s in	2		0			
	Electrical properties of the materials. Isotropic, linear and homogenous materials. Boundary conditions.							
	Electromagnetic waves. Plane wave propagation in free2space. Reflection of the perfectly conducting boundary.2							
	Electromagnetic radiation.	Hertz dipole. Image metho	od.		2		0	
	Introduction to the numeric domain analysis. Domain c discretization methods.	al modeling. Frequency ar liscretization methods. Bo	nd time undary		2		0	
O sum a sentent	Introduction to the Finite el	ement method.			2		0	
broken down in	Introduction to the antenna Polarization.	theory. Antenna paramete	ers.		2		0	
class schedule	Radiation pattern. Directivit	ty. Gain.			2		0	
(syllabus)	Radiated power and radiat	ion resistance. Near and fa	ar field.		2	_	0	
	Typical antenna systems.				2		0	
	Antenna design.	· · · ·			2		0	
	Basics of antenna modeling	g in frequency domain.			2	_	0	
	Basics of antenna modeling indirect approach.	g in time domain – direct a	Ind		2		0	
	List of laboratory or design	exercises				LE ( hc	or DE ours	
	EM waves propagating in d	ielectric					2	
	EM wave incident to the PE	C ground					2	
	Short dipole radiated EM fie	eld				_	2	
	Software package SuzANA	<ul> <li>– frequency domain</li> </ul>					4	
	Software package SuzANA	– time domain					4	
	Software package NEC						6	

	Design and analysis software	Design and analysis of a commercial antenna system using NEC 10 software						
Format of instruction	<ul> <li>☑ lectures</li> <li>☑ seminars and workshops</li> <li>☑ exercises</li> <li>☑ on line in entirety</li> <li>☑ partial e-learning</li> <li>☑ field work</li> <li>☑ laboratory</li> <li>☑ work with mer</li> <li>☑ (other)</li> </ul>			nt assignments nentor er)	assignments entor r)			
Student responsibilities	The presence on lec Performed all require	tures in ed labor	the amo atory exe	unt of at least 7 ercises.	70 % of the time	es sched	luled.	
Screening student	Class attendance	2,0	Researc	h	Practical training	ng		
proportion of ECTS	Experimental work		Report		Individual work	ĸ	1,0	
credits for each activity so that the total number of ECTS credits is	Essay		Semina essav	r	Laboratory exe	Laboratory exercises		
	Tests	0,2	Oral exa	am	Preparation for laboratory exe	r rcises	0,2	
value of the course)	Written exam	0,1	Project		(Other)			
Grading and evaluating student work in class and at the final exam	Inere are two midte lecturing and the set take tests they didn' min. and consists of is required to preser during laboratory exercis positive evaluation following way: where M1 and M2 are Final grade is determ Score Grad 50% to 62% suffi 63% to 75% good 76% to 88% very 89% to 100% excer In the final exams st is performed in the v part of the course. In 50% of total points are grade is then determ	There are two midterms and final exams. The first midterm exam is after 7 weeks ecturing and the second one is after the next 6 weeks. In the final exams studen ake tests they didn't pass on the midterm exams. First midterm test lasts for the 7 nin. and consists of 10 questions or problems. For the second midterm exam studens required to present computer model of a commercial antenna system developed during laboratory exercises. In order to pass the exam, students are required to finis all laboratory exercises, gain at least 50% of total points at first midterm exam ar positive evaluation of the second midterm exam. Final score is determined ollowing way: Score(%) = 0,5 (M1 + M2) where M1 and M2 are midterm exams score. Final grade is determined according the final score: Score Grade 50% to 62% sufficient (2) 53% to 75% good (3) 76% to 88% very good (4) 39% to 100% excellent (5) n the final exams students take tests they didn't pass on the midterm exams. Exa s performed in the written form for the first part and in the oral form for the second as performed in the written form for the first part and in the oral form for the second according the exam, students are required to gain at least 50% of the course. In order to pass the exam, students are required to gain at least 50% to 62% sufficient (5)						
		Title	)		copies in the library	Availa other	bility via <sup>r</sup> media	
Required literature (available in the library and via other media)	<ul> <li>Poljak, D., Dorić, V., Antonijević S.: Modeliranje žičanih antena primjenom računala, Kigen, Zagreb, 2009.</li> <li>G. J. Burke, A.J. Poggio, "Numerical Electromagnetics Code NEC Method of Moments – Part III: User's guide", Lawrence Livermore National Laboratory, 1981</li> </ul>			; , 				
	E. Zentner: Antene 2001.	i radios	ustavi, G	aphis, Zagrel				

	ijak, D., Dorić, V., Antonijević S.: Modeliranje anih antena primjenom računala, Kigen, Zagreb, 09.							
Optional literature	D.Poljak, Teorija elektromagnetskih polja s primjenama u inženjerstvu. Šk. knjiga							
(at the time of	Zagreb, 2014.							
submission of study	D.Poljak N.Kovač, V. Dorić, Numeričke metode u elektrotehnici – interna skripta,							
programme	SB-Split 2006.							
proposal)	Macnamara, T.: Handbook of Antennas for EMC, Artech House, 1995.							
Quality assurance	<ul> <li>Evaluation of results in accordance with the above learning outcomes</li> </ul>							
methods that ensure	<ul> <li>Feedback from students via surveys</li> </ul>							
the acquisition of	- Self-evaluation of teachers							
exit competences	<ul> <li>Institutional and non-institutional evaluations</li> </ul>							
Other (as the								
proposer wishes to								
add)								

NAME OF THE COURSE	COMPUTER AND DATA	SECURIT	Y					
Code	FELP16	Year of s	tudy	3				
Course teacher	Julije Ožegović, Ph.D., Full Professor	Credits (E	ECTS)	5				
Associate teachers	Lada Sartori, Senior Lecturer, Vesna Pekić,	Type of ir	nstruction	L	S	AE	LE	DE
	Ph.D., Ante Kristic, Ph.D.	Dereente		30	0	30	0	
Status of the course	Elective	applicatio	n of e-learning	0				
	COURSE	DESCRI	PTION					
Course objectives	Training students for: - Course provides ba security.	asic knowl	edge of comput	er syst	ems,	networ	ks and	l data
Course enrolment requirements and entry competences required for the course	None	lone						
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	Students will be able to: define security on the information system management level classify networked system differences explain operating systems weaknesses use hardened operating systems apply computer supported security management adapt computer security policy							
	Course content					L or S	h	AE ours
	Information system security organization in project and implementation phases							0
	Deep defense methodology. Windows computer hardening. 2							
	Physical computer security	. Passwor	d strength. Ever	nt loggi	ng.	2 0		0
	Malicious programs. Denia	l of service	e and spoofing a	ttacks.		2		0
	UNIX server hardening.	<u> </u>				2		0
	Web browser weaknesses.	Security p	parameters. SSL			2		0
	Active web page, mail serv	er and DN	S risks.			2		0
Course content	technology.	protocols.	Wireless transf	er		2		0
broken down in	Wireless networks protection	on. Encryp	tion, authenticat	tion. N	AT.	2		0
class schedule	Firewall.					2		0
(svllabus)	Intrusion detection systems	S.				2		0
(-)/	Cryptography essentials.					2		0
	Confidentiality, integrity and	d authentio	cation.			2		0
	Denial of service attacks. C	Connection	hijacking.			2		0
	Security policies. Governm integrity.	ent regula	tions. Persona d	lata		2		0
	List of laboratory or design	exercises					LE o	or DE ours
	Security properties of Wind	ows opera	ting system.					6
	Windows operating system	hardening						6
	Implementation of Ethereal	system.	aveta m					6
	becunity properties of LINUX	dening	system.					0 6
Format of instruction		aoning.	Mindonandant	ocoicr	mont	<u> </u>		5
Format of instruction			independent	assigr	ment	5		

	seminars and wor	kshops		🗆 multimedia					
	⊠ exercises			⊠ laboratory					
	□ <i>on line</i> in entirety			□ worl	] work with mentor				
	□ partial e-learning				(other)				
	field work								
Student responsibilities	Attend all forms of te laboratory exercises	eaching, , pass p	pass ing reliminar	ress an y exam:	d egres s or full	s tests, perforn exam (numeric	n 100% and theo	ory).	
Screening student work (name the	Class attendance	1	Researc	h		Practical traini	ng	1	
proportion of ECTS credits for each	Experimental work		Report			Auditory exerc	ises		
activity so that the total number of	Essay		Seminar essay	•		Individual lear	ning	3	
ECTS credits is	Tests		Oral exa	ım		(Other)			
value of the course)	Written exam		Project			(Other)			
Grading and evaluating student work in class and at the final exam	Continuous assessment: laboratory tests, practical tests, knowledge tests, preliminary exams. Exam: written and oral (numeric and theory) as unity.								
	Title					Number of copies in the library	Availabi other r	ility via nedia	
Required literature	<ol> <li>Klasić, K.: Zaštita informacijskih sustava, Biblioteka inženjera sigurnosti, Iproz , Zagreb, 2002.</li> </ol>								
library and via other media)	<ol> <li>Benak, M.: Plan oporavka u slučaju katastrofe, Savjetovanje CASE 12, Opatija, 2000.</li> </ol>								
inoula)	<ol> <li>Dragičević, D.: Kompjutorski kriminalitet i informacijski sustavi, Informator, Zagreb 1999</li> </ol>								
	<ol> <li>Ellis, J. i Speed, T.: The Internet Security Guidebook from Planning to Deployment, Academic Press, 2001.</li> </ol>								
Optional literature (at the time of submission of study programme proposal)	- Lecture note - Upute za lat	es, conti poratorijs	nuously u ske vježb	ıpgrade e, Inter	ed net				
Quality assurance methods that ensure the acquisition of exit competences	<ul> <li>Lecture atter</li> <li>Annual example</li> <li>Student feed</li> <li>Teacher self</li> <li>Graduated self</li> </ul>	nding ev n passir dback w f-evalua tudents	vidence ng analys ith teache tion feedbacl	is er evalu «	ation				
Other (as the proposer wishes to add)									

NAME OF THE COURSE	COMPUTER ARCHITECTURES								
Code	FELO22	Year of study	2						
Course teacher	Sven Gotovac, Ph.D., Full Professor	Credits (ECTS)	5						
Associate teachers	Dunja Gotovac	Type of instruction (number of hours)	L 30	S	AE	LE 30	DE		
Status of the course	Elective	Percentage of application of e-learning	0						
	COURSE	E DESCRIPTION							
Course objectives	<ol> <li>Training students for:</li> <li>Understand digital com</li> <li>Define difference betw.</li> <li>Understand computer a</li> <li>Understand and apply application problem.</li> </ol>	<ol> <li>Understand digital computer architecture.</li> <li>Define difference between different computer architecture on assembler level.</li> <li>Understand computer architecture on the digital circuits level.</li> <li>Understand and apply different computer architecture according to the application problem.</li> </ol>							
Course enrolment requirements and entry competences required for the course	c programming language Digital electronics and circuits								
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<ol> <li>Students will be able to:         <ol> <li>Understand difference between computer architecture from the Instruction Set Point of view (ISA)</li> <li>Identify the properties and performance of different architectures at the level of logic circuits</li> <li>Select and apply the appropriate computer architecture according to the problem being solved.</li> <li>Evaluate the impact of architecture on a software solution (advantages and disadvantages).</li> </ol> </li> </ol>								
	Course content				_ or S	h	AE ours		
	Introduction. Different view Data and instructions. Clas Instructions, Instruction set Modes. CISC. RISC.	r	2						
	Instruction level processor Architecture)	design (Instruction Set			2				
	Arithmetical and Logical ins Transfer.	structions, Instruction for D	)ata		2				
Course content	Flow control instructions, T then to binary code.	ranslation from C to asser	nbler aı	nd	2				
broken down in detail by weekly	Processor design on digital microarchitecture.	I circuits level. Single bus			2				
ciass schedule (syllabus)	Microarchitecture.	Logic Design for the 1-Bu	S		2	_			
	Control Unit design, 2-Bus	and 3-Bus Microarchitectu	ire		2				
	Instruction-Level Parallelier	m - Problems and Solution	ne	-+	2	+			
	Memory System Design, M Level Memory Hierarchy.	lemory System Componer	nts, Two	D-	2				
	Cache, Associative cache, Cache.	Direct Mapped Cache, 2-	way		2				
	U/I system design.				2				
	List of laboratory or design	exercises				LE ( ho	or DE ours		
	ARM Architecture - Introduc	ction.					2		

	ARM Instruction Set	Archited	ture, Reg	gisters, Memory	/, Stack.		2
	Atmel Studio IDE. Program Structure						2
	Instruction Set, Arithe	metical a	and Logic	al Instructions,	Dana Transfer		8
	Instructions, Branch	Control	Instructio	ns			
	Procedures						2
	Program Examples		oot				10
	PTODIETTIS TOT EXERCIS		esi				4
	⊠ lectures						
	□ seminars and wor	kshops		⊠ independen	t assignments		
	□ exercises			🗵 multimedia			
Format of instruction	$\Box$ on line in entirety			☑ laboratory			
	□ partial e-learning			□ work with m	entor		
	$\Box$ field work			□ (othe	er)		
Student	The presence on lec	tures in	the amo	unt of at least 7	0 % of the time	s sched	uled.
responsibilities	Performed all require	ed labor	atory exe	ercises.			
Screening student work (name the	Class attendance	2	Researc	h	Practical traini	ng	
proportion of ECTS	Experimental work		Report		Laboratory exe	ercises	2
activity so that the	Essay		Semina essay	·	Preparation for laboratory exe	r rcises	
ECTS credits is	Tests	0,4	Oral exa	am	Self-study		0,5
equal to the ECTS value of the course)	Written exam	0,1	Project				
Grading and evaluating student work in class and at the final exam	lecturing and the se minutes and consists tests consist of 6 the students that did not are carried out as w assessment of labor final exam. Grade (in the activities in perce • LV – laborat • M1, M2 – te The final grade will k ECTS grading syste system of the Univer divided into four grou following B (very god ). A group of student required), or F (signi Rulebook for Exam, the completion of cla According to Article participate in all form and laboratory exe conditions, the stude	cond on s of 5 to eoretica pass the vritten te ratory ex- n percer Grad- entage: tory asses st result be detern m in accorsity of S ups: 15% od), the ts who c ificant ac only two asses. e 65 of team rcises of ent will n	the is after 7 theoret 1 question e midtern e sts. The exercises a tage) is f e(%) = 0, essment, s. mined after cordance Split. The K of the k next 35% lid not pa dditional o exam p the Stat ching and 100% of not be abl	the next 6 we ical questions a ns and numeric nexams take particular requirement for and 50 % point formed accordin 33 LV + 0,33 (for the first test with the Regular group of stude best gets the group of stude to rating C (good ss the exam gar work is required eriods are organ ute of the Fact attend: lecture teaching hou e to access the	term by applyin ations on the st att Mark Mark Mark art. The midterm or passing grac s on each midt ag to the formul M1 + M2) term by applyin ations on the st nts who passed ade A (exceller d), and the last ins FX score (a d). In accordance nized in the exa sulty, the stude is at least 70% of rs. If you do e exam	ng a rela udy and the erm exa a rela udy and the exa to a rela the exa to a rela the exa to a rela udy and the exa to a rela the exa the e	lasts 60 and final al exams al exams positive im or the study am is of the ing D, E al work is he od after bliged to ing hours et these
Required literature (available in the		Title	)		Number of copies in the library	Availal other	bility via media
library and via other media)	Heuring, V.P., Jored Design and Architec AddisonWesley, 200	lan, H.F ture, 2rc )3	.: Compu d edition,	ter Systems	2	Electro On e-l	nic copy earning

	S.Gotovac Authorized lectures from the Digital Computer Architecture		On e-learning				
Optional literature (at the time of submission of study programme proposal)	Hennesy & Patterson, "Computer Architecture: A Qua edition, Morgan Kaufmann, 2011	nnesy & Patterson, "Computer Architecture: A Quantitative Approach", 5rd tion, Morgan Kaufmann, 2011					
Quality assurance methods that ensure the acquisition of exit competences	<ol> <li>Class attendance records.</li> <li>Evaluation of results in accordance with the abov</li> <li>Feedback from students via surveys</li> <li>Self-evaluation of teachers</li> <li>Feedback from students who have already gradu</li> <li>Institutional and non-institutional evaluations</li> </ol>	e learning out	comes				
Other (as the proposer wishes to add)							

NAME OF THE COURSE	COMPUTER NETWORKS	COMPUTER NETWORKS							
Code	FELP08	Year of study	2						
Course teacher	Julije Ožegović, Ph.D., Full Professor	Credits (ECTS)	5						
Associate teachers	Stipe Braica, Lecturer, Mario Mornar, Lecturer, Vesna Pekić, Ph.D., Ante	Type of instruction (number of hours)	L 30	S 0	AE 15	LE 15	DE 0		
Status of the course	Kristic, Ph.D. Obligatory 550 Elective 510	Percentage of application of e-learning	0						
	COURSE	DESCRIPTION	-						
Course objectives Training students for: - Course provides fundamental knowledge of computer networks as computer engineering core.									
Course enrolment requirements and entry competences required for the course	None	Vone							
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	tudents will be able to: clasify fundamental terms and architecture of computer networks describe ISO/OSI and TCP/IP protocol stacks explain TCP/IP protocol stack on application layer implement IP protocol, IP addressing and IP routing use LAN protocols and their functionality on physical and data layers use WAN protocols and their functionality on physical and data layers describe addressing on physical, data, network and transport layers								
	Course content L or S hours								
	Development of data comm methods.		2		1				
	Importance of standardization. Open systems. Network elements.						1		
	Computer network architec structures. ISO model.		2		1				
	Protocols. Protocol mechan Error control.	g.	2		1				
	Traffic and congestion con	trol, flow control.			2		1		
Course content	Physical level: DTE-DCE in connections, intelligent mo	nterface, RS232, X.24. Mo dems. Signal codes.	dem		2		1		
broken down in	Local networks. Access me	ethods. Ethernet.			2		1		
detail by weekly	Wireless local networks. D	igital subscriber networks.			2		1		
class schedule	Data level: Error control.				2		1		
(Syllabus)	Character and bit oriented	protocols.			2		1		
	Local networks: MAC, LLC	. Ethernet.			2		1		
	Wireless local networks.				2		1		
	Network level: Packet netw	vorks. Traffic routing.			2		1		
	Internet. IP protocol (v4, v6	6), addressing, intranet, ro	uting.		2		1		
	Transport level: TCP and L protocol flow control.	JDP Internet protocols. TC	P		2		1		
	List of laboratory or design	exercises				LE o ho	or DE ours		
	DTE DCE interface.						2		
	Modem - data transfer using	g analogue telephone cha	nnel.			_	2		
	Local network Ethenet.						2		

	Connecting compute	r to Inte	rnet subr	etwork.				2
	Connecting subnetwo	ork to pu	ublic Inter	net.				2
	Virtual local networks	<u>.</u>						2
	Wireless local netwo	rks						2
Format of instruction	<ul> <li>☑ lectures</li> <li>□ seminars and wor</li> <li>☑ exercises</li> <li>□ on line in entirety</li> <li>□ partial e-learning</li> <li>□ field work</li> </ul>	□ seminars and workshops       □ multimedi         ☑ exercises       □ on line in entirety       □ laboratory         □ partial e-learning       □ work with         □ field work       □ (ot         Attend all forms of teaching, pass ingress and egree			penden imedia oratory < with m (othe	t assignments entor er)		
Student responsibilities	Attend all forms of te laboratory exercises	eaching, , pass p	pass ing reliminar	ress an y exam	d egres s or full	s tests, perform exam (numeric	100% and the	ory).
Screening student work (name the	Class attendance	1	Researc	h		Practical trainin	ng	0,5
proportion of ECTS credits for each	Experimental work		Report			Auditory exerc	ises	0,5
activity so that the total number of	Essay		Seminar essay			Individual learr	ning	3
ECTS credits is equal to the ECTS	Tests		Oral exam		(Other)			
value of the course)	Written exam		Project			(Other)		
Grading and evaluating student work in class and at the final exam	Continuous assessment: laboratory tests, practical tests, knowledge tests, preliminary exams. Exam: written and oral (numeric and theory) as unity.							
Required literature	Title					Number of copies in the library	Availal other	oility via media
library and via other	1. Turk, S.: Računa Zagreb, 1991	arske m	reže, Ško	olska kn	jiga,			
ineula)	2. Rožić, N.: Inform s primjenama, Z	nacije i k agreb 1	omunika 992.	cije: koo	diranje			
Optional literature (at the time of submission of study programme proposal)	<ul> <li>Ožegović, J.</li> <li>Lecture note</li> <li>A. Kristić, V.</li> </ul>	. Računa es: Ožeg . Pekić:	alne mreż jović, J., Upute za	že, Vele Računa Iaborat	eučilište Ine mre orijske v	u Splitu, 2000 že, continuousl vježbe, Internet	y upgra	ded
Quality assurance methods that ensure the acquisition of exit competences	<ul> <li>Lecture atte</li> <li>Annual exar</li> <li>Student feed</li> <li>Teacher self</li> <li>Graduated s</li> </ul>	nding ev n passir dback w f-evalua students	vidence ng analys ith teache tion feedbac	is er evalu k	ation			
Other (as the proposer wishes to add)								

NAME OF THE COURSE		G								
Code	FENO08	Year of study	2							
Course teacher	Mateo Bašić, Ph.D., Associate Professor	Credits (ECTS)	5							
Associate teachers	M.Sc. Ivan Grgić	Type of instruction	L	S	AE	LE	DE			
	_		30	0	15	15	0			
Status of the course	Obligatory	Percentage of application of e-learning	0							
	COURS	E DESCRIPTION								
Course objectives	<ul> <li>Training students for:</li> <li>understanding and application of basic principles of automatic control,</li> <li>analysis and synthesis of automatic control systems.</li> </ul>									
Course enrolment requirements and entry competences required for the course	None									
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<ul> <li>Students will be able to:</li> <li>solve by calculation sp control,</li> <li>describe the basic com</li> <li>sketch Nyquist and Boi</li> <li>apply Laplace transforr automatic control syste</li> <li>calculate the stability a</li> <li>carry out the experiment typically found in autom</li> <li>experimentally test the system,</li> <li>explain the basic feature</li> </ul>	tudents will be able to: solve by calculation specific engineering problems in the field of automatic control, describe the basic components of automatic control systems sketch Nyquist and Bode plots of automatic control systems, apply Laplace transform and block algebra in the analysis and synthesis of automatic control systems, calculate the stability and quality indicators of automatic control, carry out the experimental analysis and synthesis of the passive R-C elements typically found in automatic control systems, experimentally test the dynamic quality indicators of an air-temperature control system,								
	Course content				L hours	h	AE ours			
	Basic concepts of automat automatic control systems	ic control and classification	of		2		1			
	Laplace transform, elemen evaluation of the time function	ts of a control circuit and ion properties			2		1			
	Frequency domain analysis	s: Nyquist and Bode metho	ods		2		1			
	Transfer functions and time elements	e responses of elementary	linear		2		1			
Course content	Frequency characteristics of amplifiers	of circuits with operational			2		1			
broken down in detail by weekly	DC machine as an object of	of control			2		1			
class schedule	Transfer functions of multile (block algebra)	oop automatic control syste	ems		2		1			
(Synabus)	First midterm exam									
	Stability of automatic contro Hurwitz, Nyquist, and Bode	ol systems. Stability criteric a.	ons by		2		1			
	Control quality indicators				2		1			
	PID controllers: subtypes a method of tuning the PID c	nd discrete form. Ziegler-N ontroller parameters.	Nichols		2		1			
	Experimental synthesis of a a DC motor	a cascade speed-control sy	ystem c	of	1		1			
	Synthesis of linear systems parallel correction)	s of automatic control (seria	al and		1		1			

	Digital control: z-tran	Digital control: z-transform, sampling process and digital 2							1
	Control systems	ntation of	of a syste	m			2		1
	Second midterm exa	m	<i>n a sys</i> ic	,111			2		
									IF
	List of laboratory exe	rcises						ha	ours
	Passive and active ci	rcuits wi	ith R-C e	lements					3
	Bode magnitude and	phase p	olots						3
	Air temperature control	ol syste	m						3
	Speed control system	stem	narately	evoited DC	` moto	r			3 3
	In lectures	101 2 30	paratory		/ 111010	1			5
	$\Box$ seminars and wor	kshops		☐ indeper	ndent a	assignme	ents		
	⊠ exercises			🛛 multime	edia				
Format of instruction	$\Box$ on line in entirety			⊠ laborate	ory				
	□ partial e-learning			□ work wi	th mei	ntor			
	☐ field work			□ (other)					
Student	The presence on lect	tures in	the amo	unt of at lea	ast 70	% of the	times schedu	led.	
responsibilities	Performed all require	d labora	atory exe	rcises.					
Screening student	Class attendance	1	Researd	ch		Practica	al training		
proportion of ECTS	Experimental work		Report			Individu	al work		2.7
activity so that the	Essay		Semina	r essay		Laborat	ory exercises		0.5
ECTS credits is	Midterm exams	0.2	Oral exa	am		Auditor	y exercises		0.5
equal to the ECTS value of the course)	Written exam	0.1	Project			(Other)			
	During the semester, two midterm exams are held - the first after 7 weeks of lectures and the second after 13 weeks of lectures. Each midterm exam consists of 4 problems, either theoretical or numerical. In the final exams, students take those parts of the course which they did not pass in the midterm exams.								
	The requirement for (L) and the midterma more. The sum is cal	passing s' grade lculated	grade is s (M1 a as	s that the s nd M2), ex	um of (press	the labo ed as a	ratory exercis percentage, i	es' s 5(	grade 0% or
	Grade (%) = $0.25$	5L + 0.3	75(M1 +	M2)					
	where the number of	points a	achieved	in each mi	dterm	exam ha	as to be at lea	st 5	0%.
Grading and evaluating student work in class and at the final exam	The students that do consists of 4 problem at least 50% points a the midterm exams a course. Subsequent	o not pa ns. The achieved are pres y, the gi	ss the m requirem d. In the ented win rade is de	idterm exa nent for a p final exam, th 4 proble etermined a	ims tal positive the st ms fro as follo	ke the fine evaluate udents t m the co ows:	nal written exa ion of the fina hat did not pa prresponding p	am al ex as c bart	which kam is one of of the
	Grade (%) = 0.2	5L + 0.7	75(I)						
	where I is the numbe	r of poir	nts achie	ved in the f	inal wi	ritten exa	am (at least 50	)%)	
	The final grade for th	e cours	e is dete	rmined as f	ollows	:			
	50% to 61% - Suffici 62% to 74% - Good 75% to 87% - Very g 88% 100% - Exceller	ient (2) (3) good (4) nt (5)							

Required literature (available in the library and via other	Title	Number of copies in the library	Availability via other media					
media)	<ul> <li>Vukadinović, D., "Predavanja iz Regulacijske tehnike za šk. god. 2010/11", FESB, Split, 2014.</li> </ul>		e-learning portal					
Optional literature (at the time of submission of study programme proposal)	- Goodwin, G.C., Graebe, S.F., Salgado M.E., "Co Hall, 2001.	Goodwin, G.C., Graebe, S.F., Salgado M.E., "Control System Design", Prentice Hall, 2001.						
Quality assurance methods that ensure the acquisition of exit competences	<ul> <li>Keeping records of student attendance</li> <li>Annual analysis of the performance at laboratory</li> <li>Annual analysis of the performance at midterm e.</li> <li>Feedback from students via surveys</li> <li>Self-evaluation of teachers</li> </ul>	exercises xams and fina	exams					
Other (as the proposer wishes to add)								

NAME OF THE COURSE	CONTROL OF ELECTRIC	CAL DRIVES									
Code	FENO17	Year of study	3								
Course teacher	Mateo Bašić, Ph.D., Associate Professor	Credits (ECTS)	5								
Associate teachers		Type of instruction (number of hours)	L 30	S 0	AE 0	LE 30	DE 0				
Status of the course	Elective	Percentage of application of e-learning	0				8				
	COURSE	DESCRIPTION									
Course objectives - understanding and application of basic control principles in DC and application of basic control principles in DC and a electrical drives, - synthesis and commissioning of a controlled electrical drive.											
Course enrolment requirements and entry competences required for the course	None	synthesis and commissioning of a controlled electrical drive.									
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	Students will be able to: solve by calculation specific engineering problems in the field of control of electrical drives, sketch functional schemes of control systems with electrical motors, demonstrate experimentally the control of a DC motor, carry out the simulation and experimental synthesis of a controlled DC electrical drive, demonstrate the scalar control of an induction motor on the simulation level, explain the basic principles of synchronous motor control,										
	Course content					ho	L ours				
	Basic concepts and definitions of electrical drives. Steady-state characteristics and selection of motors for electrical drives.										
	DC motor as an object of c	rives					4 1				
	Control structures with a se	nves	r				4 4				
	Power converters for AC d	rives					3				
	Induction motor as an obje	ct of control					3				
	First midterm exam						2				
Course content	Scalar control of induction	motors					2				
broken down in											
detail by weekly	Synchronous motor as an o	object of control					2				
(svllabus)											
(-))	The application of compute electrical drives	ers in the simulation and in	npleme	ntatior	n of		2				
	Second midterm exam						2				
	List of laboratory exercises	i				ho	.⊏ ours				
	Simulation modelling and d a separately-excited DC mo	etermination of mechanica	I chara	acterist	ics of		4				
	Experimental determination separately-excited DC moto	of mechanical characteris	tics of	а			4				
	Simulation synthesis of a ca excited DC motor	ascade speed-control syste	em of a	a sepa	rately-		4				

	Experimental synthes	xperimental synthesis of a cascade speed-control system of a							
	Commissioning and s	speed c	ontrol of a	a separa	ately-ex	cited DC motor by	4		
	utilizing a commercia	l power	converte	r .	,		4		
	Scalar speed control commercial frequenc	of a squ y conve	uirrel-cage erter - ope	e induct	tion mot applicat	tor by utilizing a	5		
	Scalar speed control commercial frequenc	of a squ v conve	urrel-cage erter - clos	e induct sed loor	tion mot	tor by utilizing a	5		
Format of instruction	<ul> <li>☑ lectures</li> <li>□ seminars and wor</li> <li>☑ exercises</li> <li>□ on line in entirety</li> <li>□ partial e-learning</li> <li>□ field work</li> </ul>	<ul> <li>☑ lectures</li> <li>□ seminars and workshops</li> <li>☑ exercises</li> <li>□ on line in entirety</li> <li>□ partial e-learning</li> <li>□ field work</li> <li>□ field work</li> <li>□ (ot performed all required laboratory exercises</li> </ul>			epender timedia pratory k with n er)	nt assignments			
Student responsibilities	The presence on lec Performed all require	tures in ed labor	the amou atory exe	unt of at rcises.	t least 7	0 % of the times sched	uled.		
Screening student	Class attendance	1	Researc	h		Practical training			
proportion of ECTS	Experimental work		Report			Individual work	2.7		
activity so that the total number of	Essay		Seminar essay	,		Laboratory exercises	1		
ECTS credits is	Midterm exams	0.2	Oral exa	m		(Other)			
value of the course)	Written exam	0.1	Project			(Other)			
Grading and evaluating student work in class and at the final exam	During the semester and the second aft problems, either the parts of the course w The requirement for (L) and the midterm more. The sum is ca Grade (%) = 0.2 where the number of The students that do consists of 4 problem at least 50% points a the midterm exams a course. Subsequent Grade (%) = 0.2 where I is the number The final grade for th 50% to 61% - Suffic 62% to 74% - Good 75% to 87% - Very 88% 100% - Excelle	, two mi er 13 v coretical which the passing s' grade lculated 5L + 0.3 f points o not pa ns. The achieved are pres ly, the g 25L + 0. er of poi the cours cient (2) (3) good (4 nt (5)	aterm exa veeks of or nume ey did not g grade is es (M1 an d as 375(M1 + achieved ss the min requirem d. In the fi ented with rade is de 75(I) nts achieves (5)	ams are lecture rical. In that the d M2), M2) in each dterm e ent for a nal exan of 4 prob etermined wed in the	a neid - 1 s. Each in the fir in the mi e sum of express in midter exams ta a positiv m, the s ilems fro ed as follow	ine first after 7 weeks of n midterm exam consi- hal exams, students tai idterm exams. If the laboratory exercises sed as a percentage, is m exam has to be at lease ake the final written exa- re evaluation of the final students that did not pas- both the corresponding p illows: written exam (at least 5 ws:	ectures sts of 4 ke those es' grade 5 50% or ast 50%. m which exam is ss one of art of the 50%).		

Required literature (available in the	Title	Number of copies in the library	Availability via other media					
library and via other media)	<ul> <li>Bašić, M., "Predavanja iz predmeta Upravljanje elektromotornim pogonima (511)", FESB, Split, 2020.</li> </ul>		e-learning portal					
Optional literature (at the time of submission of study programme proposal)	<ul> <li>Leonhard, W.: "Control of Electrical Drives", Sprir</li> <li>Wach, P.: "Dynamics and Control of Electrical Dr</li> <li>Bose, B.K.: "Modern Power Electronics and AC E</li> </ul>	Leonhard, W.: "Control of Electrical Drives", Springer - Verlag, 1996. Wach, P.: "Dynamics and Control of Electrical Drives", Springer, 2011. Bose, B.K.: "Modern Power Electronics and AC Drives", Prentice Hall, 2002.						
Quality assurance methods that ensure the acquisition of exit competences	<ul> <li>Keeping records of student attendance</li> <li>Annual analysis of the performance at laboratory</li> <li>Annual analysis of the performance at midterm e</li> <li>Feedback from students via surveys</li> <li>Self-evaluation of teachers</li> </ul>	exercises xams and fina	l exams					
Other (as the proposer wishes to add)								

NAME OF THE COURSE	CONTROL SYSTEM DESIGN										
Code	FELO18	Year of s	tudy	3							
Course teacher	Mojmil Cecić, Ph.D., Full Professor	Credits (E	ECTS)	5							
Associate teachers	Marko Lete, mag. ing.	Type of ir (number	nstruction of hours)	L 30	S 0	AE 0	LE 30	DE 0			
Status of the course	Elective	Percenta application	ge of on of e-learning	0							
	COURSE	DESCRI	PTION								
Course objectives	<ul> <li>Training students for:</li> <li>understanding and application of basic principles and laws of the a control,</li> <li>design the control systems in the time and frequency domain,</li> <li>application the computer in the analysis and synthesis of control systems.</li> <li>permanent adoption and deepening of knowledge in the field of consystems.</li> </ul>										
Course enrolment requirements and entry competences required for the course	None	Vone									
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<ul> <li>Students will be able to:</li> <li>analyse the phase-lead and phase-lag compensators in the time and frequency domain,</li> <li>design the phase-lead and phase-lag compensator,</li> <li>design the feedback compensator,</li> <li>analyse the PI, PD and PID controller in the time and frequency domain,</li> <li>determine the controller gains using one of several analytic methods,</li> <li>simulate various control systems using VISSIM,</li> </ul>										
	Course content				L	or S	/ hc	\E ours			
	Approaches to system desi	ign				2					
	Positioning system, operati	onal ampl	Approaches to system design								
	Compensators, Phase-lead	l phone le	Positioning system, operational amplifier, DC motor								
	PL PD PID controllors	Compensators, Phase-lead, phase-lag compensator									
	PI, PD, PID controllers					4 4 4					
	Root locus	1, priase-ia	ifier, DC motor ag compensator			4 4 4 2					
Course content	Root locus Design using the root locus	s. serial an	ifier, DC motor ag compensator d parallel compe	ensatio	n	4 4 4 2 8					
Course content	Root locus Design using the root locus System design using control	s, serial an	ifier, DC motor ag compensator d parallel compe	ensatio	n	4 4 2 8 2					
Course content broken down in detail by weekly class schedule	Root locus Design using the root locus System design using contro List of laboratory or design	s, serial an ol design s exercises	ifier, DC motor ag compensator d parallel compe software	ensatio	n	4 4 2 8 2		or DE ours			
Course content broken down in detail by weekly class schedule (syllabus)	Root locus Design using the root locus System design using contro List of laboratory or design Identification of DC motor part	s, serial an ol design s exercises arameters	ifier, DC motor ag compensator d parallel compe software	ensatio	n	4 4 2 8 2		or DE ours 2			
Course content broken down in detail by weekly class schedule (syllabus)	Root locus Design using the root locus System design using contro List of laboratory or design Identification of DC motor p Operational amplifier	s, serial an ol design s exercises arameters	ifier, DC motor ag compensator d parallel compe software	ensatio	n	4 4 2 8 2		or DE ours 2 2			
Course content broken down in detail by weekly class schedule (syllabus)	Root locus Design using the root locus System design using contro List of laboratory or design Identification of DC motor pro Operational amplifier Positioning system	a, priase-ia s, serial an ol design s exercises arameters	ifier, DC motor ag compensator d parallel compe software	ensatio	n	4 4 2 8 2		or DE ours 2 2 2			
Course content broken down in detail by weekly class schedule (syllabus)	Root locus Design using the root locus System design using contro List of laboratory or design Identification of DC motor pr Operational amplifier Positioning system Phase-lead and phase-lag of	a, priase-ia s, serial an ol design s exercises arameters compensa	ifier, DC motor ag compensator ad parallel compe software	ensatio	n	4 4 2 8 2		or DE burs 2 2 2 4			
Course content broken down in detail by weekly class schedule (syllabus)	Root locus Design using the root locus System design using control List of laboratory or design Identification of DC motor p Operational amplifier Positioning system Phase-lead and phase-lag of Pl, PD, PID controllers	s, serial an ol design s exercises arameters compensa	ifier, DC motor ag compensator d parallel compe software	ensatio	n	4 4 2 8 2		or DE ours 2 2 2 4 4			
Course content broken down in detail by weekly class schedule (syllabus)	Root locus Design using the root locus System design using contro List of laboratory or design Identification of DC motor pro Operational amplifier Positioning system Phase-lead and phase-lag of Pl, PD, PID controllers Serial compensation	a, priase-ia s, serial an ol design s exercises arameters compensa	ifier, DC motor ag compensator d parallel compe software	ensatio	n	4 4 2 8 2		or DE ours 2 2 2 4 4 4 2 2			
Course content broken down in detail by weekly class schedule (syllabus)	Root locus Design using the root locus System design using control List of laboratory or design Identification of DC motor pr Operational amplifier Positioning system Phase-lead and phase-lag of Pl, PD, PID controllers Serial compensation Parallel compensation Root locus -MATLAB	a, priase-ia s, serial an ol design s exercises arameters compensa	ifier, DC motor ag compensator ad parallel compe software tors	ensatio	n	4 4 2 8 2		or DE ours 2 2 2 4 4 2 2 2 2 2 2 2 2 2 2 2 2 2 2			
Course content broken down in detail by weekly class schedule (syllabus)	Root locus Design using the root locus System design using contro List of laboratory or design Identification of DC motor po Operational amplifier Positioning system Phase-lead and phase-lag of Pl, PD, PID controllers Serial compensation Parallel compensation Root locus –MATLAB System design using MATL	a, phase-la s, serial an ol design s exercises arameters compensa	ifier, DC motor ag compensator d parallel compe software tors	ensatio	n	4 4 2 8 2		or DE ours 2 2 2 2 4 4 2 2 2 2 4 4 2 2 2 6			
Course content broken down in detail by weekly class schedule (syllabus)	Root locus Design using the root locus System design using contro List of laboratory or design Identification of DC motor pro Operational amplifier Positioning system Phase-lead and phase-lag of Pl, PD, PID controllers Serial compensation Parallel compensation Root locus –MATLAB System design using MATL I lectures	a, priase-ia s, serial an ol design s exercises arameters compensa	ifier, DC motor ag compensator d parallel compe software tors SSIM	ensatio	n	4 4 2 8 2		or DE ours 2 2 2 2 4 4 4 2 2 2 2 6			
Course content broken down in detail by weekly class schedule (syllabus)	Root locus Design using the root locus System design using contro List of laboratory or design Identification of DC motor pr Operational amplifier Positioning system Phase-lead and phase-lag of Pl, PD, PID controllers Serial compensation Parallel compensation Root locus –MATLAB System design using MATL In lectures In seminars and workshops	a, priase-ia s, serial an ol design s exercises arameters compensa AB and VI	ifier, DC motor ag compensator d parallel compe software tors SSIM SSIM	ensatio	ments	4 4 2 8 2		or DE burs 2 2 2 2 4 4 2 2 2 2 4 4 2 2 2 6			
Course content broken down in detail by weekly class schedule (syllabus)	Root locus Design using the root locus System design using contro List of laboratory or design Identification of DC motor pr Operational amplifier Positioning system Phase-lead and phase-lag of Pl, PD, PID controllers Serial compensation Parallel compensation Root locus –MATLAB System design using MATL Image lectures Image seminars and workshops Image control contr	a, phase-la s, serial an ol design s exercises arameters compensa AB and VI	ifier, DC motor ag compensator d parallel compe software tors SSIM SSIM independent multimedia a laboratory	ensatio	n	4 4 2 8 2		or DE ours 2 2 2 2 4 4 2 2 2 2 4 4 2 2 2 6			

	□ partial e-learning □ field work		۵		(othe	er)		
Student responsibilities	The presence on lec Performed all require	tures in ed labor	the amount atory exert	nt of at cises.	t least 7	0 % of the time	s schedul	led.
Screening student	Class attendance	2,0	Research	1		Practical traini	ng	
proportion of ECTS	Experimental work		Report			Individual work	<	2,5
credits for each activity so that the total number of	Essay		Seminar essay		0,2	(Other)		
ECTS credits is	Tests	0,2	Oral exan	n		(Other)		
equal to the ECTS value of the course)	Written exam	0,1 Project		(Other)				
Grading and evaluating student work in class and at the final exam	The requirement for and 50% points on e formed according to where L is laboratory exams in percentage Each midterm test c final test also consis into two groups (the 50% of the total nur exams take part in t written tests. Finally from 50% to from 62.5% t from 75% to from 87.5% t	dterms and final exams. The first midterm exam is after 7 wee second one is after the next 6 weeks. for passing grade is the positive assessment of laboratory exer on each midterm exam or the final exam. Grade (in percentage to the formula: Grade [%] =0,25*L+0.375* (M1 + M2) tory assessment and M1 and M2 are the results of the midtern tage. st consists of 10 theoretical questions and numerical problems insists of 10 theoretical questions and numerical problems div the first and the second part). The requirement for passing gra number of questions. The students who did not pass the mid in the final exam. The midterm and final exams are carried of ally grade is determined as follows: to 62.5% - dovoljan (2) % to 75% - dobar (3) to 87.5% - vrlodobar (4) % to 100% - izvrstan (5)						
Required literature		Title	)			Number of copies in the library	Availabi other n	lity via nedia
(available in the	Cecić, M.: Sinteza re	egulacijs	skih sustav	va, autł	norized		e-lear	ning al
media)	Rohrs, C.E.; Melsa, Control Systems, Mo New York, 1993., 2d	J.L.; Scl cGraw-F edition	hults, D.G. Iill Internat	:: Linea tional E	ar Edition,	1	port	
Optional literature (at the time of submission of study programme proposal)	D'Azzo, J.J.; Houpis Hill International Edi	, C.H.: L tio, New	inear Con York, 199	trol Sy 95.	stem A	nalyses and De	esign, McC	Graw-
Quality assurance methods that ensure the acquisition of exit competences	<ul> <li>Evaluation of res</li> <li>Feedback from s</li> <li>Self-evaluation c</li> <li>Institutional and</li> </ul>	sults in a students of teache non-ins	accordance via surveg ers titutional e	e with ys valuati	the abo	ve learning out	comes	
Other (as the proposer wishes to add)								

NAME OF THE COURSE	DESIGNING AND USING	COMPUTER NETWORK	s						
Code	FELP17	Year of study	3						
Course teacher	Julije Ožegović, Ph.D., Full Professor	Credits (ECTS)	5						
Associate teachers	Lada Sartori, Senior Lecturer, Vesna Pekić, Ph.D., Ante Kristic, Ph.D.	Type of instruction (number of hours)	L 30	S 0	AE 0	LE 30	DE 0		
Status of the course	Elective	Percentage of application of e-learning	0						
	COURSE	DESCRIPTION	•						
Course objectives	Training students for: - Course provides ba implementation and	asic knowledge of computed d management.	er netw	orks c	lesign,				
Course enrolment requirements and entry competences required for the course	None								
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	tudents will be able to: list basic parts of computer network project design computer network project obeying investor's parameters perform measurements on structural cabling of computer network connect active and passive network equipment adjust basic network services handle with implemented computer network analyze computer network operational problems								
Course content broken down in detail by weekly class schedule (syllabus)	Course content Architecture and technolog Structural cabling architect Wired and optical local netw Implementation prerequisite Project documentation part Network elements tagging Work groups as network pr Virtual local networks desig Internet protocols, IP addre Internet protocols, IP addre Internet routing. Virtual private networks. Computer networks virtuali Network services and funct Network management. Computer network security List of laboratory or design Structural cabling. Data link measurements. IP addressing and subnetwor TCP/IP protocol stack and r Internet routing protocols. Access lists, NAT, DHCP.	y of local computer networ ure. works components. es and installation measur s and design. system. oject basis. gn and management. essing. zation. tions. projecting. exercises orks. outing.	rks.	3. 	or s       hours       2 <td></td> <td>AE purs 0 0 0 0 0 0 0 0 0 0 0 0 0</td>		AE purs 0 0 0 0 0 0 0 0 0 0 0 0 0		
	Switch management, STP. VLAN management.						3 2 2		

	Complex network sys	stem im	plementa	tion (final test)			4			
Format of instruction	<ul> <li>lectures</li> <li>seminars and wor</li> <li>exercises</li> <li>on line in entirety</li> <li>partial e-learning</li> <li>field work</li> </ul>	kshops		<ul> <li>☑ independent assignments</li> <li>□ multimedia</li> <li>☑ laboratory</li> <li>□ work with mentor</li> <li>□ (other)</li> </ul>						
Student responsibilities	Attend all forms of te laboratory exercises	eaching, , pass p	s tests, perform exam (numeric	100% and theo	ory).					
Screening student	Class attendance	1	Researc	ch	Practical trainir	ng	1			
proportion of ECTS credits for each activity so that the	Experimental work		Report		Auditory exerci	ses				
	Essay		Seminal essay	r	Individual learn	ning	3			
ECTS credits is	Tests		Oral exa	am	(Other)					
equal to the ECTS value of the course)	Written exam		Project		(Other)					
Grading and evaluating student work in class and at	Continuous assessment: laboratory tests, practical tests, knowledge tests, preliminary exams. Exam: written and oral (numeric and theory) as unity.									
the final exam										
the final exam		Title	)		Number of copies in the library	Availabi other r	ility via nedia			
the final exam Required literature (available in the	1. Turk, S.: Računa Zagreb, 1991	<b>Title</b> arske m	e reže, Ško	olska knjiga,	Number of copies in the library	Availabi other r	ility via nedia			
the final exam Required literature (available in the library and via other media)	<ol> <li>Turk, S.: Računa Zagreb, 1991</li> <li>Rožić, N.: Inform s primjenama, Z</li> </ol>	<b>Title</b> arske m nacije i k agreb 1	reže, Ško komunika 992	olska knjiga, icije: kodiranje	Number of copies in the library	Availabi other r	ility via nedia			
the final exam Required literature (available in the library and via other media)	<ol> <li>Turk, S.: Računa Zagreb, 1991</li> <li>Rožić, N.: Inform s primjenama, Z</li> <li>Ožegović, J., Pe računalnim mrež 2000.</li> </ol>	<b>Title</b> arske m nacije i k agreb 1 szelj I. P žama, V	reže, Ško comunika 992 rojektirar eleučilišto	olska knjiga, icije: kodiranje nje i upravljanje e u Splitu,	Number of copies in the library	Availabi other r	ility via nedia			
Required literature (available in the library and via other media) Optional literature (at the time of submission of study programme proposal)	<ol> <li>Turk, S.: Računa Zagreb, 1991</li> <li>Rožić, N.: Inform s primjenama, Z</li> <li>Ožegović, J., Pe računalnim mrež 2000.</li> <li>Lecture note continuously</li> <li>Upute za lat</li> </ol>	Title arske m nacije i k agreb 1 zelj I. P źama, V źama, V	reže, Ško comunika 992 rojektirar eleučilišto gović, J., led ske vježb	olska knjiga, icije: kodiranje ije i upravljanje e u Splitu, Projektiranje i k pe, Internet	Number of copies in the library	Availabi other r	ility via media			
the final exam Required literature (available in the library and via other media) Optional literature (at the time of submission of study programme proposal) Quality assurance methods that ensure the acquisition of exit competences	<ol> <li>Turk, S.: Računa Zagreb, 1991</li> <li>Rožić, N.: Inform s primjenama, Z</li> <li>Ožegović, J., Pe računalnim mrež 2000.</li> <li>Lecture note continuously</li> <li>Upute za lat</li> <li>Lecture atter</li> <li>Annual exart</li> <li>Student feed</li> <li>Teacher self</li> <li>Graduated s</li> </ol>	Title arske m nacije i k agreb 1 izelj I. P žama, V žes: Ožeg v upgrac poratoriji nding ev n passir dback w f-evalua students	reže, Ško comunika 992 rojektirar eleučilišto gović, J., led ske vježb vidence ng analys ith teacho tion feedbac	olska knjiga, icije: kodiranje nje i upravljanje e u Splitu, Projektiranje i k pe, Internet is er evaluation k	Number of copies in the library	Availabi other r	ility via nedia			

NAME OF THE COURSE	DESIGN OF LOW VOLTA	GE FACILITIES								
Code	FENO25	Year of study	3.							
Course teacher	Marin Despalatović, Ph.D., Associate Professor	Credits (ECTS)	5							
Associate teachers		Type of instruction (number of hours)	L 15	S	AE	LE 45	DE			
Status of the course	Elective	Percentage of application of e-learning	0							
	COURSE	E DESCRIPTION								
Course objectives - Independently prepare project documentation, - Design simple low voltage installations.										
Course enrolment requirements and entry competences required for the course	None									
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<ol> <li>Students will be able to:</li> <li>List the relevant regula</li> <li>Explain the role of an a documentation,</li> <li>Classify symbols and la</li> <li>Use computer tools for</li> <li>Classify the elements of</li> <li>Describe the procedure</li> <li>Use computer tools for</li> <li>Choose elements for p</li> <li>Compare theoretical kn experimental results of</li> <li>Discover the causes of</li> </ol>	<ul> <li>Students will be able to:</li> <li>List the relevant regulations and standards in electrical engineering,</li> <li>Explain the role of an authorized electrical engineers in preparation of design documentation,</li> <li>Classify symbols and labels of electrical elements in the project documentation,</li> <li>Use computer tools for creating electrical wiring diagrams,</li> <li>Classify the elements of low voltage facilities,</li> <li>Describe the procedure of designing of low voltage facilities,</li> <li>Choose elements for protection of low voltage facilities,</li> <li>Compare theoretical knowledge of low voltage switching equipment with the experimental results obtained in the laboratory,</li> </ul>								
	Course content					Lo	or S			
	Introduction, regulations ar standardization and produc Chamber of Electrical Engi	nd standards in electrical e ct safety. Legislation in des neers, authorized electrica	enginee signing, al engin	ring, , Croat neer.	ian		1			
	Project substrate, specifica construction conditions, pro detailed design. The estimation	ation of requirements, anal oject task. Elements of pre ation of project costs.	ysis of Iiminar	the y, mair	n and		1			
Course content	Symbols and labeling of ele wiring diagrams. Computer	ectrical elements, single-p r tools for project documer	ole and tation.	three-	pole		1			
broken down in	Electric cables and wires: I	abeling, laying, connectior	าร.				1			
detail by weekly class schedule (syllabus)	Power distribution systems installations: transformers, filters, electrical machinery lighting, heaters.	and low voltage equipme chokes, compensations, p , controlled and uncontroll	nt for e bassive ed elec	lectrica and a tric driv	al ctive ves,		1			
	Low voltage switchgear eq circuit breakers, contactors voltage and/or frequency c and sizing of components.	uipment: signaling, discon s, relays, thermal and num onverters, computer tools	nectors erical re for the	s, fuses elays, selecti	s, on		1			
	Distribution cabinets: select electromagnetic compatibil cabinets.	ting the size and cooling, ity, computer tools for sele	ayout e	elemen Ind sizi	its, ng of		1			
	First midterm exam						1			

	Coordination of insul simplification, reduce sustained short circu	ation. C ed size, uit, comp	alculation voltage coonent se	n of electrica Irops, power lection base	al networks: flows, sudden and ed on the mechanical	1		
	Computer tools for c	alculation	ons of she	ort-circuit, vo	oltage drops and other	1		
	Explosion protection	: explos	ive atmos	spheres, lab	eling and certification,	1		
	The errors in the sys	seriuar	Igereu by	explosive a	a causes and remedy	1		
	Selected examples (	of desig	n of LV s	/stem - auto	mated electric motor	· ·		
	drive, pump station.					1		
	Selected examples of	of design	n of LV sy	/stem - elec	tric elevator, small	1		
	hydroelectric power	piant.						
	Second midlenn cha					I E or	DE	
	List of laboratory or o	design e	ercises			hou	irs	
	1. Building-technical	Building-technical regulations for vocational area of electrical						
	2 Computer tools for	gineering. Computer tools for project documentation.						
	3. Elect <u>ric cables and</u>	distrib	utio <u>n cab</u> i	nets.		6		
	<ol> <li>Low voltage switch</li> </ol>	ngear.				9		
	5. Computer tools for	the cal	culation of	of electric ne	tworks.	9		
			design or	IOW VOILage	Installations.	ษ		
	□ seminars and wor	kshops		□ independ	lent assignments			
				⊠ multimedia				
Format of instruction	□ on line in entirety			⊠ laboratory				
	□ partial e-learning							
	□ field work							
Student responsibilities	The presence on lec Performed all labora	tures in tory exe	the amore	unt of at leas	st 70% of the times sche	duled.		
Screening student	Class attendance	0,5	Researc	h	Practical training			
work (name the proportion of ECTS	Experimental work		Report		Individual work	2	2,3	
activity so that the	Essay		Seminar essay		Laboratory exercises	1	1,5	
total number of ECTS credits is equal to the ECTS	Tests	0,1	Oral exa	ım	Preparation for laboratory exercises	C	),5	
value of the course)	Written exam	0,1	Project		(Other)			
Grading and evaluating student work in class and at the final exam	There are two midte weeks of lecturing ar students can pass th students take the par exams. A separate p The exams are carri 60 minutes, while ex The requirement for and the positive ass Grade (in percentage where ME1, ME2 - points of LE - average grade	Prm exa nd the s e entire ts of ma part of th ed out a ams are passing sessmer e) is for Gra bbtained of all lat	ms durin econd on exam. O aterial whi he mater as written e 2x60 mi grade is of (minim med as for ade(%) = at (midte poratory e	g semester. e is after the n the exam ( ch they did r ial means th tests. The nutes. at least 50% um 50% of ollows: (ME1 + ME2 erm) exams of exercises exp	The first midterm exame e next 6 weeks. By midte final, correctional and co not pass on the midterm be material of each midt duration of the midterm 5 of points on each (midt points) of all laboratory 2 + LE) / 3 expressed in percentages	is aft erm ex- mmiss or prev- erm ex- exams exams erm) e: exercis	er 7 ams sion) rious cam. are xam ises.	

	The final grade is determined as follows:					
	Percentage         Grade           0% to 49%         insufficient (1)           50% to 61%         sufficient (2)           62% to 74%         good (3)           75% to 87%         very good (4)           88% to 100%         excellent (5)					
	Exam group: 14 Examinations are held in accordance with the course	calendar sche	edule.			
Required literature (available in the	Title	Number of copies in the library	Availability via other media			
media)	M. Despalatović: Autorizirana predavanja, FESB		e-learning portal			
Optional literature (at the time of submission of study programme proposal)	N. Srb: Elektroinženjerski priručnik (2. izdanje), Kiger J. Weidauer, R. Messer: Electrical Drives - Principles Solutions, Publicis Publishing, Erlangen, 2014. SINAMICS - Low Voltage Engineering Manual, Sieme Switching, Protection and Distribution in Low-Voltage Publicis-MCD-Verlag, Munchen, 1994.	n, Zagreb, 200 , Planning, Ap ens, 2014. ⊧ Networks (2™	9. plications, <sup>d</sup> Ed), SIEMENS,			
Quality assurance methods that ensure the acquisition of exit competences	<ul> <li>UDIICIS-INCD-Veriag, Munchen, 1994.</li> <li>Keeping records of students course attendance</li> <li>Annual review of the performance of the examinations</li> <li>Evaluation of results in accordance with the above learning outcomes</li> <li>Feedback from students via surveys</li> <li>Self-evaluation of teachers</li> <li>Institutional and non-institutional evaluations</li> </ul>					
Other (as the proposer wishes to add)						

NAME OF THE COURSE	DIGITAL TECHNIQUES								
Code	FELO11	Year of study	510-2	, 550-	1				
Course teacher	Julije Ožegović, Ph.D., Full Professor	Credits (ECTS)	7						
Associate teachers	Stipe Braica,Lecturer, Vesna Pekić, Ph.D., Ante Kristic, Ph.D.	Type of instruction (number of hours)	L 45	S 0	AE 30	LE 15	DE 0		
Status of the course	Obligatory	Percentage of application of e-learning							
	COURSE	DESCRIPTION	-						
Course objectives	<ul> <li>Training students for:</li> <li>Course provides fundamental knowledge of Boolean algebra and a theory as the digital electronics basis, with practical skills of combinand sequential circuits' synthesis including programmable structure</li> </ul>								
Course enrolment requirements and entry competences required for the course	None								
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<ul> <li>Students will be able to:</li> <li>design combinatorial and sequential logic circuit</li> <li>choose optimal design method</li> <li>use Boolean algebra properties application</li> <li>use small, medium and high scale integration circuits</li> <li>explain the information structure of the system</li> <li>explain the achieved results of digital system modelling and synthesis</li> </ul>								
	Course content Digital and analog signals, information and coding.					/ hc	λE burs 0		
	Number systems. Binary n	umber system.			3		0		
	Modulo arithmetic.				2		0		
	Logic gates.				1		0		
	Boolean algebra and logic	algebra.			2		0		
	Boolean functions. Decom	position to partial functions	6.		3		0		
	Logic algebra complete sys	stems			1		0		
	Minimization of Boolean function and circuit realization using logic gates.						3		
Course content	Circuit realization using mu	Itiplexers and demultiplex	ers.		3		2		
broken down in	Multiplexer - demultiplexer	structures (ROM).			3		2		
detail by weekly	Programmable logic structu	ures.			3		2		
(syllabus)	Time relations. Bistables. E registers and counters. Me	Bistable synthesis. Registe mories (RAM).	rs, shif	t	3		2		
	Discrete finite digital autom	ata. Specification of autor	nata.		3		2		
	Minimization of digital auto	mata. Structural synthesis	·		6		2		
	Programmable automata. concept. Algorithms	Wilkies' model. Microprogr	ammin	g	3		0		
	List of laboratory or design	exercises				LE o	or DE ours		
	Logic gates.	otion and size it realized			actor		4		
	Circuit realization of Boolean fur	tion and circuit realizatio	n using	logic	gates.		4 1		
	Programmable logic structu	res synthesis (FPROM C	ΔI )				4		
	Bistable synthesis.		/ \ <b>L</b> /.				4		
	Finite automata synthesis u	sing logical gates and bist	ables.				4		

	inite automata synthesis using programmable logic structures (EPROM, 4) AAL). Turing machine simulation.							
Format of instruction	<ul> <li>☑ lectures</li> <li>□ seminars and workshops</li> <li>☑ exercises</li> <li>□ on line in entirety</li> <li>□ partial e-learning</li> <li>□ field work</li> </ul>			<ul> <li>□ independer</li> <li>□ multimedia</li> <li>⊠ laboratory</li> <li>□ work with m</li> <li>□ (otherwork)</li> </ul>	nt assignments nentor er)			
Student responsibilities	Attend all forms of te laboratory exercises	Attend all forms of teaching, pass ingress and egress tests, perform 100% aboratory exercises, pass preliminary exams or full exam (numeric and theory).						
Screening student work (name the	Class attendance	1,5	Researc	h	Practical training	ng	1	
proportion of ECTS	Experimental work		Report		Auditory exerc	ises	0,5	
activity so that the	Essay		Seminai essay	·	Individual learr	ning	4	
ECTS credits is	Tests		Oral exa	am	(Other)			
equal to the ECIS value of the course)	Written exam		Project		(Other)			
Grading and evaluating student work in class and at	Continuous assessment: laboratory tests, practical tests, knowledge tests, preliminary exams. Exam: written and oral (numeric and theory) as unity.							
the final exam	preliminary exams. I	Exam: w	ritten and	d oral (numeric	and theory) as	unity.	18313,	
the final exam	preliminary exams. I	Exam: w Title	vritten and	d oral (numeric	and theory) as Number of copies in the library	Availabi other r	lity via nedia	
the final exam Required literature (available in the library and via other	preliminary exams. E 1. Ožegović, J. Dig tehnika, Veleuči	Exam: w Title jitalna i i lište u S	mikroproo	cesorska	and theory) as Number of copies in the library	Availabi other r	ility via nedia	
the final exam Required literature (available in the library and via other media)	<ol> <li>Džegović, J. Dig tehnika, Veleuči</li> <li>Župan-Tkalić-Ku digitalnih sustav 1984, 1995.</li> </ol>	Exam: w Title jitalna i i lište u S inštić: L a, Škols	ritten and mikroproo plitu, 200 ogičko pr ka knjiga	cesorska ojektiranje , Zagreb,	and theory) as           Number of           copies in           the library	Availabi other r Ye	lity via nedia	
the final exam Required literature (available in the library and via other media) Optional literature (at the time of submission of study programme proposal)	<ol> <li>Džegović, J. Dig tehnika, Veleuči</li> <li>Župan-Tkalić-Ku digitalnih sustav 1984, 1995.</li> <li>Ožegović, J. vježbe, inter</li> <li>Lecture note</li> </ol>	Exam: w Title lište u S unštić: L a, Škols . Digitali ma skrip es: Ožeç	mikroproc plitu, 200 ogičko pr ka knjiga na i mikro ota, FESE gović, J.,	oral (numeric cesorska <u>12.</u> ojektiranje , Zagreb, procesorska te Split 1995. Digitalna elektr	and theory) as Number of copies in the library ehnika, upute za onika, continuo	Availabi other r Ye a laborato usly upgr	l <b>iity via</b> nedia	
the final exam Required literature (available in the library and via other media) Optional literature (at the time of submission of study programme proposal) Quality assurance methods that ensure the acquisition of exit competences	<ol> <li>Džegović, J. Dig tehnika, Veleuči</li> <li>Župan-Tkalić-Ku digitalnih sustav 1984, 1995.</li> <li>Ožegović, J. vježbe, inter</li> <li>Lecture note</li> <li>Lecture atten</li> <li>Annual exam</li> <li>Student feedt</li> <li>Teacher self-</li> <li>Graduated stu</li> </ol>	Exam: w Title jitalna i u lište u S unštić: L a, Škols . Digitalı na skrip es: Ožeg ding evid passing pack with evaluatio udents fe	mikroproo plitu, 200 ogičko pr ka knjiga na i mikro ta, FESE gović, J., lence analysis teacher e on eedback	ojektiranje Joral (numeric ojektiranje JZ ojektiranje JZ ojektiranje JZ ojektiranje JZ ojektiranje JZ JU JU JU JU JU JU JU JU JU JU JU JU JU	and theory) as Number of copies in the library chnika, upute za onika, continuo	Availabi other r Ye	liity via nedia	

NAME OF THE COURSE	ELECTRICAL DISTRIBUTION NETWORKS							
Code	FENO12	Year of study	2					
Course teacher	Damir Jakus, Ph.D. Assistant Professor	Credits (ECTS)	5					
Associate teachers	Josip Vasilj, Ph.D.	Type of instruction (number of hours)	L 30	L S AE LE 30 0 15 15			DE	
Status of the course	Mandatory	Percentage of application of e-learning	30					
	COURSI	E DESCRIPTION						
Course objectives	<ul> <li>Training students for:</li> <li>Understanding the and operation as w</li> <li>Development of mostationary condition</li> <li>Understanding the earthing</li> <li>Calculation of shor</li> <li>Selection of netword and ability to proposed of the conditions</li> <li>Deepening the bast distribution</li> </ul>	specifics related to the nervell as network element co odels for the distribution nerve specifics related to the distribution dens t circuit currents in distribution rk elements while respection se measures for the network effects of distribution gent ic knowledge in the field of	twork s nstruction etwork a stribution ng the t ork ope leration of electri	tructur on analysi n netw tworks echnic ration i conne	e, grid s unde ork ne al requ improv ction c	plann er utral uireme emen on netv sion a	ing ents ts work nd	
Course enrolment requirements and entry competences required for the course	None							
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<ul> <li>Students will be able to:</li> <li>Identify the typical structures of the distribution networks and their components with all their specifics</li> <li>Define the classic single line diagram and disposition of distribution substations</li> <li>Determine the equivalent circuits of distribution network elements for different type of calculations</li> <li>Perform the distribution network power flow and voltage conditions analysis using specialized software packages</li> <li>Simulate the impact of distributed generation connection on distribution network conditions</li> <li>Parametrize the distribution network elements to ensure normal network operation</li> <li>Select low voltage network protection devices and dimensioned TS 10 / 0.4 kV earthing system</li> <li>To carry out a techno-economic analysis of the excessive consumption of reactive power and to propose measures for power factor improvement</li> </ul>							
Course content broken down in detail by weekly class schedule (syllabus)	power and to propose measures for power factor improvement         Simulate the operation of the distribution network and to calculate energy loss         Course content       L or S         1. DISTIRIBUTION NETWORK POSITION AND ROLE IN ELECTRIC POWER SYSTEMS:       -         - production, transmission and distribution of electrical energy       2         - basic characteristics and differences of transmission and distribution networks       2         2. DISTIRBUTION NETWORK TOPOLOGY AND STRUCTURE:       -         - Middle voltage network structure       2         - Low voltage network structure       2         - JUSTIRBUTION NETWORK SUBSTATIONS:       -						AE Durs	

	- Examples of real distribution substations 110/35 V, 35/10 kV	
4	BASIC ELECTRIC PARAMETERS AND FOLIVIVAL NET	+
	SCHEMES FOR NETWORK ELEMENTS	
	- Symmetrical components system	_
	- Physical interpretation of direct, inverse and zero system	2
	- Calculation of element impedances	
	- Equivalent schemes	
5.	DISTRIBUTION NETWORK FAULT ANALYSIS (PART 1)	1
	- Three phase fault	
	- Two phase fault	3
	- Single phase faults	
	- Single phase faults in low voltage grid	<b></b>
6.	DISTRIBUTION NETWORK FAULT ANALYSIS (PART 2)	
	- I ransformer earthling options in middle voltage distribution	
	- Single phase faults	2
	- Single phase faults in networks earthed using low-ohm	
	resistors	
	- ground radius in driedined networks	
7		+
<i>'</i> .	STATIONARY CONDITIONS	
	- Approximate load flow calculations in radial distribution	
	networks	<u> </u>
	- Approximate voltage drop calculations	2
	- Rating power lines and transformers based on load flow and	
	voltage drop calculations	
	- Examples of load flow and voltage profile calculations	L
8.	LOAD FLOW CALCULATION USING BACKWARD-	
	FORWARD METHOD	
	- Formation of incidence matrix: BIBC, BCBV, DLF	3
	- Load flow calculations in radial distribution networks	
	- Load flow calculations in weakly meshed distribution	
		+
9.	LOW VOLTAGE DISTRIBUTION NETWORKS (PART 1)	
	- opecificities of low voltage distribution networks	
	type	2
	- Load modeling and load flow calculations	
	- Load flow / voltage conditions calculations	
10.	LOW VOLTAGE DISTRIBUTION NETWORKS (PART 2)	Т
	- Planning and design of low voltage networks	
	- Network protection and fuse selection criteria	2
	- Grounding system calculation in low voltage distribution	
	networks	L
11.	ACTIVE POWER/ENERGY LOSS CALCULATION	
	- Power/energy loss classification	<u> </u>
	- Power losses in transformers and power lines	2
	<ul> <li>Energy loss calculations using approximate approach and using load duration auropage</li> </ul>	
12		+
12.		
	- mutvioual/group/central/mixed compensation	2
	- rushive energies of reactive power compensation	
13.	IMPACT OF DISTRIBUTED GENERATION CONNECTION	+
	<ul> <li>Impact on network voltage conditions and control</li> </ul>	
	- Impact on network losses	2
	- Impact on network protection	
	- Higner harmonics, voltage/current asymmetry, flickers	+
14.	DISTIRBUTION NETWORK OPERATION AND CONTROL	_
	- Supervision, control, SCADA	2
	- Network reliability and energy not served	

	- MTU system							
	List of laboratory or	design e	exercises					LE or DE hours
	1. Preparing for tools used in	r the lab	. exercise es	es and o	demons	tration of sof	tware	2
	2. Load flow / v	2. Load flow / voltage conditions/ power losses analysis and compensation of reactive power in the distribution networks						3
	3. The preparat	3. The preparatory exercise for the load flow calculations in low-						3
	voltage distri 4. Low-voltage	<u>bution n</u> distribut	etworks ion netwo	ork proj	ect: load	d modeling /	load flow	-
	/ voltage cald transformers testing of fus mounted sub	/ voltage calculations; selection and rating of lines and transformers, short circuit analysis, selection and compliance testing of fuses, ground resistance calculation and design of pole mounted substation 10/0.4 kV earthing (Part 1)						
	<ol> <li>Low-voltage / voltage cald transformers testing of fus mounted sub</li> </ol>	<ul> <li>5. Low-voltage distribution network project: load modeling / load flow / voltage calculations; selection and rating of lines and transformers, short circuit analysis, selection and compliance testing of fuses, ground resistance calculation and design of pole mounted substation 10/0.4 kV certhing (Pert 2)</li> </ul>						2
	<ol> <li>Analysis of d networks</li> </ol>	istribute	d genera	tion cor	nnectior	n on the distr	ibution	3
Format of instruction	<ul> <li>☑ lectures</li> <li>□ seminars and workshops</li> <li>☑ exercises</li> <li>□ on line in entirety</li> <li>□ partial e-learning</li> <li>□ field work</li> </ul>			⊠ inde ⊠ mult ⊠ labo □ worl	penden imedia ratory with m (othe	it assignmen nentor er)	ts	
Student responsibilities	<ul> <li>The presence or</li> <li>Completed all re</li> <li>Completed and</li> </ul>	n lecture equired l graded s	es in the a aboratory seminar v	amount v exercia vork as	of at lea ses. signmei	ast 70 % of th nt.	he schedu	led time.
Screening student	Class attendance	1	Researc	h		Practical tra	ining	
proportion of ECTS	Experimental work		Report			Self work		1.5
activity so that the	Essay		Seminar essay		1	Laboratory	work	0.5
ECTS credits is	Tests	0.5	Oral exa	ım		(Othe	er)	
value of the course)	Written exam	0.5	Project			(Othe	er)	
Grading and evaluating student work in class and at the final exam	During the semeste midterm exam will be the last week of sum given their seminar a exams and by comp and July, students c exams. Also, if the si then he is not oblige class subject is divide exams. Students who have subject by taking the The last chance to p the second part of the exam students have previous results in the	sts0.5Oral exam(Other)ritten exam0.5Project(Other)uring the semester there will be two midterm exams covering lectures. The fdterm exam will be in the eighth week of summer semester, and the second ona last week of summer semester. As a part of laboratory exercises students wille last week of summer semester. As a part of laboratory exercises students wille n their seminar assignments. Student can pass the class by passing two midtedams and by completing their seminar assignments. In the two final exams in Judd July, students can pass reaming part(s) which they didn't pass through midtedams. Also, if the student passes one part of class materials through first final examsass subject is divided into two parts according to separation defined for midtedams.udents who have failed to pass the class after two final exams can try to passbject by taking the disciplinary exam which is organized in first part of autumn tete last chance to pass the subject is through commission exam which will be helee second part of the autumn exam period. During the disciplinary and commissam students have to re-take whole exam covering both subject parts regarding to						

	positive mark is that the student has at least 50% stepositive mark from seminar assignment. The requirement for positive mark is that the student each part of the course subject during midterm and fir entire course subject on disciplinary and commission evaluated seminar assignment. The final score (in per- of all activities according to the formula: Grade (%) = $0.3xG1 + 0.3xG2 + 0.3xS + 0.1xP$ Grade (%) = $0.6xG + 0.3xS + 0.1xP$ (for disciplinary and wherein: • G1, G2 - points obtained for each subject part during • G - points obtained during disciplinary and commise • S – point given for seminar assignment • P - presence at lectures The final grade is determined as follows: Grade (%) Mark 50 % do 61% sufficient (2) 62 % do 74 % good(3) 75 % do 87 % very good(4) 88 % do 100 % excellent(5) Exam terms: The first and second final exam: June / July The disciplinary and commission exam: August Under the Article 65 of the Faculty Statute, the studer forms of teaching and attend: lectures at least 70% of exercises 100% of scheduled time. If you do not meet	uccess on the at has at least hal exams (or 5 on exam), as w rcentage) is for and commission g midterms and sion exam st / September ht is required to f scheduled tim these requirem	exam as well as 50% points from 0% points for the vell as positively med on the basis on exam) d(or) final exams d(or) final exams			
Required literature	Title	Number of copies in the library	Availability via other media			
(available in the library and via other	Goić R., Jakus D., Penović I.: Distribucija električne energije - interna skripta, FESB, 2014.		e-learning			
media)	Goić, R Upute za energetske proračune u niskonaponskoj distributivnoj mreži (2009), Split, FESB		e-learning			
Optional literature (at the time of submission of study programme proposal)	<ul> <li>E. Lakaervi, E.J. Holmes: Electricity Distribution Network Design, Peter Peregrinus Lt, 1989.</li> <li>Abdelhay A. Sallam, Om P. Malik:Electric Distribution Systems, Wiley-IEEE Press, 2011.</li> <li>Dale R. Patrick, Stephen W. Fardo: Electrical Distribution Systems, The Fairmont Press, 2009.</li> <li>E. Lakaervi, E.J. Holmes: Electricity Distribution Network Design, Peter Peregrinus Lt, 1989.</li> <li>William H. Kersting: Distribution System Modeling and Analysis, CRC Press, 2002.</li> <li>Programski paket PowerCAD, upute za rad (2009), Split, FRACTAL d.o.o.</li> </ul>					
Quality assurance methods that ensure the acquisition of exit competences	<ul> <li>Keeping records of student class attendance</li> <li>Annual review of the exam success</li> <li>Feedback from students via surveys</li> <li>Self-evaluation of teachers</li> <li>Feedback on the subject relevance from the form graduated</li> </ul>	er students wh	o have already			

Other (as the	
proposer wishes to	
add)	

NAME OF THE COURSE	ELECTRICAL DRIVES								
Code	FENO09	Year of study	2.						
Course teacher	Marin Despalatović, Ph.D., Associate Professor	Credits (ECTS)	5						
Associate teachers	Goran Majić, Ph.D	Type of instruction (number of hours)	L         S         AE         LE           30         15         15				DE		
Status of the course	Obligatory	Percentage of application of e-learning	0						
	COURSE	E DESCRIPTION							
Course objectives	<ul> <li>Training students to:</li> <li>Get familiar with princip electric machinery,</li> <li>Apply acquired knowle electrical drives.</li> </ul>	<ul> <li>Training students to:</li> <li>Get familiar with principle of operation and application areas of various types of electric machinery,</li> <li>Apply acquired knowledge in the analysis of existing and design of a new electrical drives.</li> </ul>							
Course enrolment requirements and entry competences required for the course	Students must be prior enrolled in "Electric Machines and Transformers" course.								
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<ol> <li>Students will be able to:         <ol> <li>Sketch the mechanical characteristics of various electric motors and working mechanisms (loads),</li> <li>Explain the principle of operation of the voltage and/or frequency converter and methods for torque control of electric machines,</li> <li>Describe experimental procedures for determining steady state and dynamic characteristics of electric machines,</li> <li>Compute characteristic quantities of ED based on measurements of electrical and/or mechanical quantities,</li> <li>Choose controlled or uncontrolled ED to adapt to working mechanism or technological process,</li> <li>Choose an electric motor to meet technical and economic requirements of drive,</li> <li>Discover the causes of errors and instability in the observed system,</li> <li>Use tool for computer modeling and simulation of electric drives,</li> <li>Analyze simulated responses of electric drive variables by comparing them with</li> </ol> </li> </ol>								
	Course content				or S	A bo	\E urs		
Course content broken down in detail by weekly class schedule	Introduction, basic terms a of application of electric dri EDs. Working and braking the various (loads) working the ED.	nd definitions, problems an ves (ED). The main states modes of ED. The charac mechanisms. The steady	nd areas of the teristics of state of	of	2		1		
(syllabus)	Overview of the electric co universal. Types of excitati compound, permanent may characteristics of separatel machines.	ommutator machines: DC, on: independent, shunt, se gnets. Steady states and e ly and/or serial excited cor	AC, erial, external nmutator		2		1		

Braking states of DC motor drive: generator, counter-current and electrodynamic braking. Ward Leonard speed control system. Converter controlled DC motor drive. Comparison of DC motor drive performance when powered from the chopper, single-phase and three-phase thyristor converters.	2	1
Overview of the slip ring and squirrel cage induction machines. Steady state and external (mechanical) characteristics of induction machines drives. Braking states of induction motor drive: generator, counter-current, electrodynamic and DC braking.	2	1
Converter controlled induction motor drive. Various topologies and principle of operation of frequency converters. Advantages and disadvantages of scalar, vector and direct torque control. Comparison of induction motor characteristics when operated with constant stator or mutual flux linkage, or constant stator current. Subsynchronous cascade. Thyristor converter fed induction motor for adjusting drive speed.	2	1
Overview of various types of synchronous machines: round rotor, salient poles, reluctance, permanent magnet. Steady state and external (mechanical) characteristics of EDs with synchronous machines. Braking states of synchronous motor drive.	2	1
Materials for permanent magnets. ED with electronically commutated motor and a synchronous motor with permanent magnets. Construction and principle of operation of special types of machines: linear, high-speed and torque motors.	2	1
First midterm exam	2	1
The dynamics of the EDs. The stability of operating point. Startup and sudden load of separately excited DC motor. Definition of the electro-mechanical time constant and the constant of inertia.	2	1
The dynamics of induction motor drives: startup and sudden load. Energy losses under transients.	2	1
Starting methods to limit starting current and torque of DC and induction machine drives. Starters, star-delta and soft (thyristor controlled) startup.	2	1
The heating and cooling performance of electric machines. The types of loads in electrical drives (S1-S10). The selection of controlled or uncontrolled ED. Energy savings.	2	1
Comparison of characteristics of various types and sizes of electric motors. The law of similarity. Technical and economic choice of the electric motor drive. Examples of EDs: a fan and an electric vehicle.	2	1
Diagnostics, monitoring and protection of electric motor drives. The causes of errors and instability. Estimation of system state variables based on the nominal data and measurements of electrical and/or mechanical quantities, the balance of power.	2	1
Second midterm exam		
List of laboratory or design exercises		LE or DE hours
1. Steady state characteristics of separately excited DC motor.		2
2. Electrodynamic braking of separately excited DC motor.		2
3. I hyristor converter fed DC motor drive.		2
Frequency converter red induction motor drive.     Flectronically commutated (BLDC) motor drive		∠ 1
6. Steady state characteristics of an induction motor		2
7. Transients in DC and induction motor drives.		2
 8. Starting of an induction motor.		2

Format of instruction	<ul> <li>☑ lectures</li> <li>☑ seminars and workshops</li> <li>☑ exercises</li> <li>☑ on line in entirety</li> <li>☑ partial e-learning</li> <li>☑ field work</li> </ul>				nt assignments nentor er)			
Student responsibilities	The presence on lec Performed all labora	tures in tory exe	the amore	unt of a	t least 7	0% of the time	s schedule	ed.
Screening student	Class attendance	1,5	Researc	h		Practical traini	ng	
proportion of ECTS	Experimental work		Report			Individual work	(	2,3
activity so that the	Essay		Seminar essay	•		Laboratory exe	ercises	0,5
total number of ECTS credits is equal to the ECTS	Tests	0,1	Oral exa	ım		Preparation for laboratory exe	r rcises	0,5
value of the course)	Written exam	0,1	Project			(Other)		
Grading and evaluating student work in class and at the final exam	There are two midte weeks of lecturing an students can pass th students take the pan exams. A separate p The exams are carri 60 minutes, while ex The requirement for and the positive ass Grade (in percentage Where ME1, ME2 - points of LE - average grade of The final grade is de Percentage Grad 0% to 49% insu 50% to 61% suffi 62% to 74% good 75% to 87% very 88% to 100% exce Exam group: 21 Examinations are he	erm exa nd the s e entire ts of ma bart of the ed out a ams are passing essmer e) is forn Grade btained of all lab termine de fficient (2) d (3) good (4 ellent (5)	ms durin econd on exam. O aterial whi he mater as written e 2x60 mi grade is nt (minim med as fo e(%) = 0,4 at (midte ooratory e d as follo (1) (1) (2) (2) (2) (3) (4) (3) (4) (3) (4) (4) (5) (4) (5) (5) (4) (5) (5) (6) (6) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7	g seme e is aften n the exist ch they ial mea tests. nutes. at least um 50% ollows: 4•(ME1 erm) exa exercise ws:	ester. The er the ne cam (fina did not ns the r The dur t 50% of 6 of poi + ME2) ams exp es expre	e calendar sche	edule.	after 7 exams hission) revious exam. ms are h) exam ercises.
		Title	)			Number of copies in	Availabi	lity via
Required literature (available in the	M ladriá D Tarziá		matarnin	ogoni I	Interne	the library		ning
library and via other	skripta, FESB, Split,	2007.	notorni p	ogoni, i	Interna		e-lear port	tal
	B. Jurković: Elektron Zagreb, 1990.	notorni p	oogoni, Š	kolska	knjiga,	6		
Optional literature (at the time of submission of study programme proposal)	I. Boldea, S. A. Nasa B. K. Bose: Power E	ar: Elect lectroni	ric Drives cs and Va	s, Taylo ariable I	r & Fran Drives, I	icis, Boca Rato EEE Press, Ne	n, 2006. ew York, 1	997.
Quality assurance methods that ensure	<ul> <li>Keeping recort</li> <li>Annual review</li> </ul>	ds of st of the p	udents co performa	ourse at	ttendand he exan	ce ninations		

the acquisition of exit competences	<ul> <li>Evaluation of results in accordance with the above learning outcomes</li> <li>Feedback from students via surveys</li> <li>Self-evaluation of teachers</li> <li>Institutional and non-institutional evaluations</li> </ul>									
Other (as the proposer wishes to add)										
NAME OF THE COURSE	ELECTRICAL INSTALLA	TIONS								
Code	FENO10 Year of study 2.									
Course teacher	Rino Lucić, Ph.D., Full     Credits (ECTS)     4									
Associate teachers	Ante Veža, assistant	Type of instruction (number of hours)	L S 30	AE	LE 30	DE				
Status of the course	regular	Percentage of application of e-learning								
	COURSE	DESCRIPTION								
Course objectives	Training students for: - practical knowledge re - implementation of basi - making project of simp	lated to electrical installation c standards related to electri le electrical installations usin	s, ical insta ig AutoC	allations, CAD softw	are					
Course enrolment requirements and entry competences required for the course	None	None								
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<ul> <li>apply relevant standard</li> <li>apply relevant standard</li> <li>explain a danger of post</li> <li>explain the basic requisition</li> <li>develop a simpler de software</li> </ul>	<ul> <li>Students will be able to:</li> <li>apply relevant standards for electrical installations,</li> <li>explain a danger of possible electric shock in electrical installations,</li> <li>explain the basic requirements for correct operation of electrical installations,</li> <li>develop a simpler design documents for electrical installations in AutoCAD software</li> </ul>								
	Course content			L or S	h	AE				
	Electrical regulations			nours	nc	ours				
	Basis types of law voltage	notworks and installations		2						
	Electrical schemes. Class voltage loads.	4								
	Protective measures and p	rotection of low voltage insta	llations.	6						
	Cable type and cross section drop and short circuit current cu	on selection. Calculation of v nt.	voltage	6						
Course content	Switching devices in low-vo	oltage installations.		2						
broken down in detail by weekly	Testing electrical installation	ns		2						
class schedule	Design of electrical installa	tions.		2						
(syllabus)	List of laboratory or design	exercises			DE	hours				
(0).00000)	Layout and types of project detailed design) of wiring in rules related to electrical ins regulations.	documentation (preliminary, the case of a residential bui stallation. Valid legislation an	main ai Iding. Th id techn	nd ne basic ical		2				
	Basic commands in AutoCA	D software used for the proj	ject			2				
	AutoCAD list of symbols us	ed in the project and drawing	j			2				
	Drawing single line diagram	s, electrical schemes, plans	, wiring,	lighting						
	installation and sockets, communication installation, grounding and lightning protection.									
	Introduction to "Ecodial" software, voltage drop, short circuit protection									
---	---	---	--	---	---	--				
	and protection against indirect contact.									
	terms of reference									
-	<ul> <li>☑ lectures</li> <li>□ seminars and wor</li> <li>□ exercises</li> </ul>	kshops		□ indepe □ multim	endent assignments nedia					
Format of instruction	□ <i>on line</i> in entirety			⊠ labora	atory					
	□ partial e-learning				with mentor					
	☐ field work				(other)					
Student responsibilities	The presence at the required laboratory e	lectures	s at least s.	70% of th	ne times scheduled. Perform	ed all				
Screening student	Class attendance	0,7	Researc	h	Practical training					
work (name the proportion of ECTS	Experimental work		Report		Independent work	2				
activity so that the	Essay		Seminai essay		Laboratory exercises	1				
ECTS credits is	Tests	0,2	Oral exa	ım	Preparation for laboratory exercises					
value of the course)	Written exam	0,1	Project		(Other)					
Grading and evaluating student work in class and at the final exam	of classes, the seco entire exam by tests At the two final exam- tests. If at the first fir part of curriculum the The condition for po- part of the curriculum formed on the basis Rating (%) = $0.1 * K'$ wherein the activity i KV - percentage obta G1, G2 - percentage lectures. Students who did no last week of August this school year is a entire curriculum, an at least 50% of entire The final score (in per- formula: Rating (%) = $0.1 * K'$ wherein the activity i KV - percentage obta The final grade is de Rating Grade	ind at the ms, studen al example studer sitive as n at the of all ac V + 0.48 s expres ained by e obtain of the fi commis d the co ercentag V + 0.9 s expres ained by ined by itermine	te first we dents tak n student nt does no ssessmen tests or a stivities ac 5 * (G1 + ssed in p y laborato ed by tes he exam rst week ssion exa ondition f ulum. ge) is form * G ssed in p y laborato exams of d as follo	e parts o passes c ot have to nat the fina ccording t G2) ercentage ory exercis ts or exail after two of Septen m. In a cc or positiv hed on the ercentage i the entire ws:	e exam period. Student can of the curriculum that did not one of the two parts of curric o take on another final exam. the student has at least 50% al exam The final grade (in p to the formula: e according to: ses, ms of the parts of curriculum final exams can pass the ex- nber. Last chance to take the ommission exam all students re assessment is that the stu e basis of all activities accord e according to: ses, e curriculum given in lectures	pass the pass the pass by ulum that of each ercent) is given in am at the exam in take the ident has ing to the s.				

	50% to 61%sufficient (2)62% to 74%good (3)75% to 87%very good (4)88% 100%excellent (5)Under Article 48 of the Statute of the Faculty, the studeall forms of teaching activities:laboratory exercises.Student should make 100% ofdoes not meet these requirements, s student will not	dent is required e at least 70 laboratory rep be able to take	d to participate in % and 100% of ports. If a student e the exams.		
Required literature (available in the library and via other	Title	Number of copies in the library	Availability via other media		
media)	R.Lucic: Lectures, FESB		e-learning portal		
Optional literature (at the time of submission of study programme proposal)	<ul> <li>G. G. Seip: Electrical Installation Handbook-Third</li> <li>E. Mileusnić: Testing of electrical installations of</li> </ul>	d Edition, Johr low voltage, Z	&Wiley, 2000. IRSI,2006.		
Quality assurance methods that ensure the acquisition of exit competences	<ul> <li>Keeping records of his attendance</li> <li>Annual review of the performance of the examinations</li> <li>Student survey in order to evaluate teachers</li> <li>Self-evaluation of teachers</li> <li>Feedback from students who have already graduated from the relevance of the course content</li> </ul>				
Other (as the proposer wishes to add)					

NAME OF THE COURSE									
Code	FELO04 Year of study 2								
Course teacher	Spomenka Bovan, M.Sc., Senior Lectuter	ka Bovan, M.Sc., ectuter 9							
Associate teachers	Ivan Marasović, Ph.D., Assistant Professor	Type of instruction (number of hours)	L 45	S	AE 45	LE 30	DE		
Status of the course	Obligatory	Percentage of application of e-learning							
	COURSE	EDESCRIPTION							
Course objectives	<ul> <li>Training students for:</li> <li>Understanding and analysis of basic analog electronic circuits</li> <li>Understanding the operating principles of the most important pulse and circuits.</li> </ul>								
Course enrolment requirements and entry competences required for the course	Successfully completed co	Successfully completed course "Electronic Devices"							
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<ul> <li>Students will be able to:</li> <li>Explain the operation of rectifier circuits</li> <li>Apply the basic electronic device models and to calculate main properties of the simple amplifier circuits.</li> <li>Describe the amplifier frequency response.</li> <li>Specify types and applications of multivibrator circuits.</li> <li>Explain the operation and calculate the properties of the simple circuits with operating amplifier.</li> </ul>								
	Course content L or S AE								
	Introduction Pasic principle	os of alastronis sirsuit ana	lucic		nours	nc	ours ว		
	Rectifier circuits and voltage	es of electronic circuit and	19515.		3		3 3		
	Introduction to electronic and voltage	nd	3		3				
	Common emitter amplifier	at DC conditions.			3		3		
	Dynamic properties of com	mon emitter amplifier.			3		3		
	Common collector and con	nmon base amplifiers.			3		3		
	FET amplifier circuits.				3		3		
3333Course content	Amplifier frequency respon	se. Cutoff frequencies.			3		3		
broken down in detail by weekly	Feedback circuits. Differen	tial amplifier.			3		3		
class schedule	Operational amplifier: defin	nition and basic properties.			3		3		
(syllabus)	Pulse and digital electronic	s. Linear wave shaping. A	nalysis	of	3		3		
	Transistor as a switch				3		3		
	Multivibrator circuits. Schm	nitt trigger.			3		3		
	List of laboratory or design exercises						or DE		
	Diode rectifier circuits.						3		
	Common emitter amplifier.						3		
	Common base amplifier. Co	ommon collector amplifier.					3		
	Common source and comm	ion drain amplifier.					3		
	n wo stage ampliner.						3		

	Differential amplifier. 3				3		
	Operational amplifier. Inverting amplifier.   3					3	
	/oltage derivation circuit.						3
	/oltage integration circuit.						3
	Schmitt trigger.						3
	☑ lectures □ seminars and wor	kshops		□ independen ⊠ multimedia	t assignments		
Format of instruction	⊠ exercises			⊠ laboratorv			
	$\Box$ on line in entirety			□ work with m	entor		
	□ partial e-learning			□ (othe	r)		
	☐ field work				-,		
Student responsibilities	Students should atte laboratory exercises	end at le	ast 70%	of the lectures.	Students must o	complete	e all
Screening student	Class attendance	3	Researc	h	Practical trainin	ng	
proportion of ECTS	Experimental work		Report		Individual work		4.25
activity so that the	Essay		Seminai essay		Laboratory exe	rcises	1
total number of ECTS credits is	Tests	0.15	Oral exa	ım	Preparation for laboratory exer	cises	0.5
value of the course)	Written exam	0.1	Project		(Other)		
Grading and evaluating student work in class and at the final exam	The final grade (in percentage) is determined according to the formula: Grade(%) = 0.2(T1+T2)+0.2(P1+P2)+0.15L+0.05NP where: T – grade from theoretical problems and lasts 165 minutes. For pass he final exam, students must score at least 50% both from theoretical problems, which are graded independently. Each midterm exam lasts 105 minutes problems, which are graded independently. Each midterm exam lasts 105 minutes for pass an exam, the student should score at least 50% both from theoretical questions and numerical problems in the midterms and also have a pose problems in the laboratory exercises. The final grade (in percentage) is determined according to the formula: Grade(%) = 0.2(T1+T2)+0.2(P1+P2)+0.15L+0.05NP where: T 1, T2 – grade from theoretical questions in midterms given in percentage L – grade from laboratory exercises given in percentage. NV – attendance at lectures given in percentage. Students not passing the midterm exams take part in the final exam. It consists of the final exam, students must score at least 50% both from theoretical part and numerical problems, as well as have a positive assessment of the laboratory exercises T – grade from theoretical questions given in percentage, T – grade from theoretical questions given in percentage, M – attendance at lectures given in percentage. NV – attendance at lectures given in percentage. NV – attendance at lectures given in percentage.					s. Each umerical ninutes. Poretical positive entage, ntage, sts of 14 passing und from xercise.	
Required literature (available in the	P Slapničar S Got	Title	ektroničk	i sklopovi	copies in the library	Availab other	ility via media
library and via other	FESB Solit 2000	5vat. El					
media)	P Bilianović: Elektro	nički ek	lonovi Či	olska knjiga	+		
	Zagrah 1080		.opovi, oi	toisita nijiya,			
	Layien, 1909.						

	I. Zulim, P. Biljanović: Elektronički sklopovi – zbirka					
	adataka, Školska knjiga, Zagreb, 1994.					
	S. Bovan: Upute za laboratorijske vježbe iz kolegija					
	Elektronički sklopovi, autorizirana skripta, FESB,					
	Split					
Optional literature (at the time of submission of study programme proposal)	<ul> <li>P. Slapničar: Impulsna I digitalna tehnika, FESB, Split, 2001.</li> <li>P. Biljanović: Mikroelektronika, Školska knjiga, Zagreb, 1989.</li> <li>A.S. Sedra, K.C. Smith: Microelectronic Circuits, 6th edition, Oxford University Press, 2009.</li> <li>J. Millman, A. Grabel: Microelectronics, 2nd edition, McGraw-Hill, 1987.</li> <li>P. Horowitz, W. Hill: The Art of Electronics, Cambridge University Press, 2015.</li> </ul>					
Quality assurance methods that ensure the acquisition of exit competences	<ul> <li>Record of number of students attending the classes</li> <li>Evaluation of results in accordance with expected learning outcomes</li> <li>Feedback from students via student surveys</li> <li>Teachers self-evaluation</li> <li>Institutional and non-institutional evaluations</li> </ul>					
Other (as the proposer wishes to add)						

NAME OF THE COURSE	ELECTRONIC DEVICES								
Code	FELO42 Year of study 1								
Course teacher	Spomenka Bovan, M.Sc., Senior Lectuter	Credits (ECTS)	6						
Associate teachers		Type of instruction (number of hours)	L 30	S	AE 30	LE 15	DE		
Status of the course	Obligatory	Percentage of application of e-learning							
	COURSE	DESCRIPTION	•						
Course objectives	<ul> <li>Training students for:</li> <li>Understanding the main properties of semiconductor materials</li> <li>Understanding the main properties and operating principles of the basic electronic devices</li> </ul>								
Course enrolment requirements and entry competences required for the course	none								
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<ul> <li>Students will be able to:</li> <li>State the basic properties of semiconductors.</li> <li>Explain the operating principle and practical application of semiconductor rectifier diode.</li> <li>Explain the operating principle and practical application of Zener diode.</li> <li>Explain the operating principle and practical application of bipolar junction transistor.</li> <li>Explain the operating principle and practical application of junction field effect transistor.</li> </ul>								
	Course content				_ or S nours	/ hc	λE ours		
	Introduction. Classification properties of crystals.	of solid materials. Electric	al		2		2		
	Intrinsic and extrinsic semi	conductors.			2		2		
	Basic laws of semiconductor	or electronics. Drift and di	ffusion		2		2		
	P-n junction				2		2		
	P-n junction under bias.				2		2		
	Current-voltage characteris	stics of p-n junction.			2		2		
Course content	Breakdown voltage, Zener	diode. Capacitive diode.			2		2		
broken down in	Bipolar junction transistor.	Modes of operation.			2		2		
detail by weekly	Transistor operation in acti	ve mode.			2		2		
(syllabus)	Transistor parameters. Sta	tic characteristics.			2		2		
	Junction field effect transis characteristics.	tor. Modes of operation. S	tatic		2		2		
	MOSFET. Modes of operate	tion. Static characteristics.			2		2		
	Components of optical com	nmunication system.			2		2		
	List of laboratory or design exercises						or DE ours		
	Semiconductor rectifier dio	de.					3		
	Zener diode.						3		
	Bipolar junction transistor.						3		
	Detection field effect transist	or.					<u>კ</u>		
							5		

Format of instruction	<ul> <li>☑ lectures</li> <li>□ seminars and workshops</li> <li>☑ exercises</li> <li>□ on line in entirety</li> <li>□ partial e-learning</li> <li>□ field work</li> <li>□ independent</li> <li>□ multimedia</li> <li>☑ laboratory</li> <li>□ work with me</li> <li>□ (other)</li> </ul>					t assignments entor :r)		
Student responsibilities	Students should atte laboratory exercises	end at le	ast 70%	of the le	ectures.	Students must	complete	all
Screening student	Class attendance	2	Researc	h		Practical training	ng	
proportion of ECTS	Experimental work		Report			Individual work	(	2.75
activity so that the	Essay		Seminal essay			Laboratory exe	ercises	0.5
total number of ECTS credits is equal to the ECTS	Tests	0.15	Oral exa	am		Preparation for laboratory exe	r rcises	0.5
value of the course)	Written exam	0.1	Project			(Other)		
Grading and evaluating student work in class and at the final exam	There are two midter after 7 weeks of cla midterm exam is wr problems. Each mid should score at leas from each midterm o exercises. The final grade (in pro- Gr Where: • NP - attenda • LV – grade f • M1, M2 – gr Students not passing theoretical questions final exam, students numerical problems, The grade on final ex- where: • NP - attenda LV – grade f • FE – grade f	Written exam       0.1       Project       (Other)         Fhere are two midterm exams and a final exam. The first midterm exam is scheduled after 7 weeks of classes and the second one after the following 6 weeks. Each nidterm exam is written and consists of 16 theoretical questions and numerical problems. Each midterm exam lasts 75 minutes. To pass an exam, the student should score at least 50% both from theoretical questions and numerical problems rom each midterm or final exam and also have a positive assessment of the laboratory exercises.         The final grade (in percentage) is determined according to the formula: Grade(%) = 0,05 NP + 0,15 LV + 0,4 (M1 + M2)         Where:         • NP - attendance at lectures given in percentage         • M1, M2 – grade from laboratory exercises given in percentage         • M1, M2 – grade from midterm exams take part in the final exam. It consists of 20 heoretical questions and numerical problems and lasts 90 minutes. For passing the inal exam, students must score at least 50% both from theoretical part and from numerical problems, as well as have a positive assessment of the laboratory exercises         The grade on final exams is determined by the formula: Grade(%) = 0,05 NP + 0,15 LV + 0,8FE         where:       NP - attendance at lectures given in percentage         • NP - attendance at lectures given in percentage         • M2 - grade from midterm exams take part in the final exam. It consists of 20 heoretical questions and numerical problems and lasts 90 minutes. For passing the inal exam, students must score at least 50% both from theoretical part and from numerical problems, as well as have a positive assessment of the laboratory exercise<						ts of 20 sing the ad from cercise.
Required literature		Title	•			copies in the library	Availabi other n	lity via nedia
(available in the library and via other	I. Zulim, S. Gotovac: elektronički elementi	Osnovi , FESB,	ni poluvo , Split, 19	dički 98.				
media)	S. Bovan, I. Marasov elementi – upute za autorizirana skripta,	/ić: Polu laborato FESB, \$	ivodički e prijske vje Split	elektroni ežbe,	ički			
Optional literature (at the time of submission of study programme proposal)	<ul> <li>P. Biljanović 2004.</li> <li>B. Juzbašić:</li> <li>S.M. Sze, K</li> </ul>	: Poluvo Elektro .K. Ng: I	odički ele nički eler Physics c	ktroničk nenti, Š of Semic	ki eleme kolska ł conducto	nti, Školska knj knjiga, Zagreb, pr Devices, Wile	iga, Zagre 1984. ey, 2006.	eb,

Quality assurance methods that ensure the acquisition of exit competences	<ul> <li>Record of number of students attending the classes</li> <li>Evaluation of results in accordance with expected learning outcomes</li> <li>Feedback from students via student surveys</li> <li>Teachers self-evaluation</li> <li>Institutional and non-institutional evaluations</li> </ul>
Other (as the proposer wishes to add)	

NAME OF THE COURSE	Electrotechnical materials and technologies							
Code	FELO01 Year of study 1.							
Course teacher	Josip Lörincz, Ph. D., Associate professor	Credits (ECTS)	4					
Associate teachers		Type of instruction (number of hours)	S	AE	LE 16	DE		
Status of the course	Obligatory (Professional study programme, 510, 511, 512)	Percentage of application of e-learning	10%			10		
	COURSE	DESCRIPTION	•					
Course objectives	<ul> <li>Training students for:</li> <li>understanding and application of basic materials and technologies used in electrical engineering</li> <li>understanding and application of conducting, semiconducting, insulating and magnetic materials in electrical engineerin</li> <li>knowledge of microelectronic and fibre-optic technologies</li> <li>permanent adoption and deepening of knowledge about new materials and</li> </ul>							
Course enrolment requirements and entry competences required for the course	None							
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<ul> <li>Students will be able to:</li> <li>define and recognise the fundamental characteristics of basic materials and technologies used in electrical engineering</li> <li>evaluate and apply fundamental materials and technologies used in electrical engineering</li> <li>evaluate and apply conducting, semiconducting, insulating and magnetic materials in electrical engineering</li> <li>evaluate and apply basic microelectronic and fibre-optic technologies</li> <li>continuously acquire new knowledges and skills about new materials and</li> </ul>							
	Course content			L	or S	/ hc	AE ours	
	Introduction. Structure and Characteristics of conductor		2		/			
	Materials for production of co alloys and aluminium.		2		/			
Course content	High-temperature melting o tantalum, niobium. Materials for specific purp	ım,	2		/			
broken down in detail by weekly	Materials for resistors, their fuses, conductors through	rmocouples, thermos-bime glass and electrical contac	etals, cts.		2		/	
class schedule (syllabus)	Superconductivity and sup Semiconducting materials. Methods of creating monoc	erconductive materials. Cleaning of semiconducto crystalline semiconductors	ors.		2		/	
	General characteristics of i materials: iron, alloys: iron-	magnetic materials. Soft-m silicon and iron-nickel.	agnetio	C	2		/	
	Soft-magnetic materials for ferromagnetic powder-like materials: Carmon-steel, d magnetic materials and magnetic	r high frequency (HF) techn cores and ferrites. Hard-m ispersion alloys, ductile ha aterials based o metal oxid	niques: agnetic ırd- es.	;	2		/	
	-				2		/	

General characteristics of isolation materials. Characteristic overview of the commonly used isolation martials: air, isolation liquids, mica, ceramics.	2	/					
Glass, varnishes, insulation kits, fiber boards and laminates, caoutchouc and rubber, synthetic resin (thermoplastic and thermoset). Printed matter.	2	/					
The process of soft soldering. Microelectronics: Introduction	2	/					
and historical development. The division of integrated							
circuits. Planar technology: general.							
Some procedures within the planar technology: epitaxy,	2	/					
oxidation or passivation Si surface, diffusion and ion							
implantation. Metallization.							
Thin-layer technology: in general, making thin film	2	/					
components (resistors, capacitors, conductive paths). Thick							
technology: generally, manufacturing of thick components							
(resistors, capacitors, conductive paths). Methods for making a specific application integrated circuit (ASIC)							
Fibre optic transmission systems: historical development, the	2	/					
spread of light through a fibre, types of optical fibre, optical							
fibre protection, types of fibre optic cable and optical fibre							
production.							
List of laboratory or design exercises	LE	E or DE hours					
Measuring the electrical resistivity		2					
Resistance measurement of color-coded resistor		2					
Varistors		2					
Thermistors		2					
Measuring temperature with thermocouple		2					
Quality testing of transformer plates and measuring losses in the iro	n	2					
Rated power dissipation of resistors		2					
Compensation for laboratory exercises		2					
<ul> <li>☑ lectures</li> <li>☑ seminars and workshops</li> <li>□ independent assignments</li> </ul>							
Format of instruction $\Box$ on line in entirety $\Box$ work with mentor							
□ partial e-learning (other)							
☐ field work							
The conditions for overall positive assessment are:							
<ul> <li>positive assessment of laboratory exercises (above 50 %)</li> </ul>							
minimum presence during 70% of overall class teaching time	e in a						
Student semester,							
responsibilities • presence on laboratory exercises during 100% of overall lab	oratory						
<ul> <li>submitted and presented seminar work with positive assess</li> </ul>	exercise time in a semester,						
	nent of						
seminar work (above 50 %)	ment of						
<ul> <li>seminar work (above 50 %)</li> <li>minimum 50% points at each mid-term or final exam (or corr commission exam).</li> </ul>	ment of ectional	or					

Screening student	Experimental work		Report		Independent v	work	1,7	
proportion of ECTS credits for each	Essay		Seminar essay	0,6	Laboratory ex	ercises	0,6	
activity so that the	Tests	0,1	Oral exam		(Other)			
ECTS credits is equal to the ECTS value of the course)	Written exam		Project		(Other)			
Grading and evaluating student work in class and at the final exam	During the semeste exam will be after 8 1st and 2nd of the f which they did not p final (correctional) e Rating (%) = 0.1PL + PL – presence on the LA- grades from labo SW - seminar work g M1, M2- the 1st and percentage), The final grade is de percentage Rating 50% to 61% is suffici 62% to 74% good (3 75% to 87% of very g 88% 100% Excellent Independently on re and 4 <sup>th</sup> final (correct In the case of organi curricula content. Re (commission) exam Examinations: 1 <sup>st</sup> Final exam 3 <sup>rd</sup> Final (correctiona 4 <sup>th</sup> Final (correctiona 4 <sup>th</sup> Final (correctiona 5 <sup>th</sup> Final (commission) specific academic ye	r there weeks of inal exa- bass on s xam, str 0.2SW - e lecture oratory ( grades (i 1 2nd mi termine ient (2) ) good (4) (5) esults ob ization of equirem is a posi al) exam al) exam ear)	will be two mid of classes, and the ms, students ta- some of the mid udents take exam- + 0,2LA + 0.25 (Mession examples) expressed in per- id-term exam gr ed as follows: the as follows: the as follows: the assessment to provide the assessment to the assessment of the assessment to the assessment to a set to a set to a trive assessment to a set to a set to a trive assessment to a set to a set to a set to a trive assessment to a set to a set to a set to a set to a trive assessment to a set	term e he 2nd a ke exan -term e m of con /1 + M2 percent pressed centage ades or he 1 <sup>st</sup> or ake exa xam, stu the adm c of labo	2 <sup>nd</sup> mid-term et m of entire curr adents also take 2 <sup>nd</sup> mid-term et m of entire curr adents also take ission on final a ratory exercises	he 1st mi of classes. of the cu rd and 4th curricula. les (expre exams, on ricula con e exam of and corrects.	d-term On the Irricula of the ssed in the 3 <sup>rd</sup> tent. entire ctional	
		Title	•		Number of copies in the library	Availabi other n	lity via nedia	
Required literature (available in the	Milutin Kapov, Josip	Lorincz	, "Materials in el ernal script_201	ectrical 5		e-lear	ning tal	
library and via other	Milutin Kapov Mariia	a Vrdolja	+	e-lear	ning			
moula	engineering , FESB-Split Internal script, 2015.portalMilutin Kapov, Marija Vrdoljak, Josip Lorincz, "Materials in electrical engineering – laboratorye-learning portal							
	"Materials in electric exercises", FESB-Sp	al engin	eering – laborate nal script, 2015.	ory		port	al	

Optional literature (at the time of submission of study	1. Viktor Šunde, Zvonko Benčić, Tomislav Filetin, Materials in electrical engineering products, Graphis, Zagreb, 2012 2. V. Bek: Technology of electro-materials" ETE Zagreb, 1989
programme proposal)	3. Internet
Quality assurance methods that ensure the acquisition of exit competences	<ul> <li>Evaluation of results in accordance with the above learning outcomes</li> <li>Feedback from students via surveys</li> <li>Self-evaluation of teachers</li> <li>Institutional and non-institutional evaluations</li> <li>Feedback from graduated students about the relevance of the course content</li> </ul>
Other (as the proposer wishes to add)	/

NAME OF THE COURSE	ELECTRICAL MEASUREMENTS								
Code	FENO24	Year of study	1.						
Course teacher	Tomislav Kilić, Ph.D., Full Professor	Credits (ECTS)	5						
Associate teachers	Tonko Garma, Ph.D.	Type of instruction	L	S	AE	LE	DE		
	Assistant Professor		30	0	0	30	0		
Status of the course	Obligatory	Percentage of application of e-learning	0						
COURSE DESCRIPTION									
Course objectives Training students for: - understanding and application of basic principles of metrology, - understanding and application of electrical measuring instruments, - applying of electrical measuring instruments and measuring methods, - expression of measuring results and uncertainty in measurement									
Course enrolment requirements and entry competences required for the course	None	lone							
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<ol> <li>Students will be able to:</li> <li>define the SI quantities and units,</li> <li>describe the basic terms and principles of metrology,</li> <li>apply rules for printing and using units,</li> <li>express results and errors of measurement,</li> <li>explain the principle of operation of analogue and digital instruments,</li> <li>describe basic methods for measuring electrical quantities,</li> <li>choose adequate measuring instrument and method,</li> </ol>								
		Course content				Lh	ours		
	Introduction to Measurements. Brief history of metrology. International system of quantities and units. Fundamental and Derived Units. Definitions of fundamental SI units. SI prefixes. Rules and style conventions for printing and using units.								
	Etalons of electrical quantit (resistance, capacitance, ir	ties. Standards of electricanductance and voltage).	I quant	ities			2		
	Measuring accuracy and un measurement result, true v	ncertainty (absolute and re alue, measurement uncer	elative ( tainty).	errors,			2		
Course content broken down in detail by weekly	Electromechanical (analog torque equation of electrom analogue instruments.	ue) instruments. Pointers a nechanical instruments. Re	and sca egulatio	ales. Th ons for	ne		2		
class schedule	The moving coil instrument instruments. The moving co	t. Extension of range of mo oil instrument with rectifier	oving c	lic			2		
(syllabus)	The moving iron instrumen Electrothermal instruments	t. The electrodynamomete	er-type	instrum	nents.		2		
	Single-phase induction-type phase induction-type energy meter.	e energy meter. Phasor di gy meter. Three-phase ind	agram uction-	of sing type er	le- nergy		2		
	First midterm exam						2		
	Null-methods. DC and AC Instrument transformers.	bridges. Unbalanced bridg	jes. Co	mpens	ators.		2		
	Theory of transformers. Po transformers. Errors introdu	tential (voltage) transformuced by transformuced by transformers.	ers. Cu	rrent			2		

	Electronic instrumen amplifiers (inverting, Differential and instr	ts. Stati non-inv umentat	c and dyi rerting. in tion ampl	namic character tegration, deriva ifiers.	istics. Operation types).	onal	2	
	Digital instruments.	A/D con	verters. D	Digital multimete	ers. Digital		2	
	Cathode ray oscillos	cope. T	ime base Digital os	generator. Dua	al trace		2	
	Methods for current,	voltage	, resistar	ce and power n	neasurement.		2	
	Second midterm exa	am	eyetenie	·			2	
	List of laboratory exe	ercises				L	E hours	
	Electrical resistance	measur	ement				2	
	Measurement uncert	easurement uncertainty of resistance measured by UI method						
	Calibration of instrum	ents by	method	of comparison			2	
	Extension of range of	t moving	g coil inst	ruments			2	
	Vieasurement of elec	reasurement of electrical quantities with oscilloscope						
	Instrument transform	inor due to nonsinusoidal signals						
	Measurement of hyst	Measurement of hysteresis loop						
	Measurement of resistance with DC bridge						2	
	Measurement of indu	ictance	and capa	citance			2	
	Measurement of three-phase power						2	
	Practical skills exam						8	
	☑ lectures	⊠ lectures						
	seminars and wor	kshops			assignments			
Format of instruction								
	□ on line in entirety				entor			
	partial e-learning     (other)				r)			
	☐ field work				')			
Student	The presence on lec	tures in	the amo	unt of at least 7	0 % of the time	s schedu	uled.	
responsibilities	Performed all require	ed labor	atory exe	rcises.			1	
Screening student work (name the	Class attendance	1	Researc	h	Practical training			
proportion of ECTS	Experimental work		Report		Individual work		2,2	
activity so that the	Essay		essay		Laboratory exe	ercises	1	
ECTS credits is	Tests	0,2	Oral exa	ım	Preparation for laboratory exe	rcises	0,5	
value of the course)	Written exam	0,1	Project		(Other)			
Grading and evaluating student work in class and at the final exam	There are two midterms and final exams. The first midterm exam is after 7 weeks of lecturing and the second one is after the next 6 weeks. Each midterm test consists of 10 theoretical questions and numerical problems and final tests consist of 20 theoretical questions and numerical problems. In the final exams students that did not pass the midterm exams take part. The midterm and final exams are carried out as written tests. The requirement for passing grade is the positive assessment of laboratory exercises and 40 % points on each midterm exam or the final exam. Grade (in percentage) is formed according to the formula: Grade(%) = 0,05 NP + 0,25 LV + 0,35 (M1 + M2) the activities in percentage: NP - attendance at lectures, LV - laboratory assessment,							
Required literature (available in the		Title	)		Number of copies in the library	Availab other	oility via media	

library and via other media)	T. Kilić: Autorizirana predavanja, FESB		e-learning portal
	S. Milun: <i>Električna mjerenja</i> – skripta s predavanja,		e-learning
Optional literature (at the time of submission of study programme proposal)	<ul> <li>V. Bego: <i>Mjerenja u elektrotehnici</i>, 9. dopunjeno iz</li> <li>D. Vujević, B. Ferković: <i>Osnove elektrotehničkih m</i> knjiga, Zagreb, 1994.</li> <li>S. Tumanski: Principles of Electrical Measurement 2005.</li> </ul>	I Idanje, Graphis I <i>jerenja – I. i II</i> I, Taylor & Frai	s, Zagreb, 2003. <i>. dio</i> , Školska ncis, New York,
Quality assurance methods that ensure the acquisition of exit competences	<ul> <li>Evaluation of results in accordance with the abov</li> <li>Feedback from students via surveys</li> <li>Self-evaluation of teachers</li> <li>Institutional and non-institutional evaluations</li> </ul>	e learning out	comes
Other (as the proposer wishes to add)			

NAME OF THE COURSE	ELECTRICAL NETWORK	s								
Code	FENO05	Year of st	udy	2						
Course teacher	Petar Sarajčev, Ph.D., Associate Professor	Credits (E	ECTS)	5						
Associate teachers		Type of i (number	nstruction of hours)	L 30	S	AE 15	LE 15	DE		
Status of the course	Obligatory	Percenta	ge of n of e-learning	0						
	COURSE DESCRIPTION									
Course objectives	Training students for: - setting-up and solving - understanding different - understanding static st - understanding power fl	problems t network e ability con low solutio	of short-circuit a earthing practice cepts n methods	nalysis es	in pov	wer sy	stems			
Course enrolment requirements and entry competences required for the course	None	one								
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<ul> <li>Students will be able to:</li> <li>define relationships between current and voltage phasors during different short-circuit types</li> <li>understand the need for different network earthing practices</li> <li>apply different approaches to the solution of short-circuit problems</li> <li>analyse and solve power flow problems</li> </ul>									
	Course content					L or S hours	AE	hours		
	Introduction to the power system analysis. Symmetrical components. Per-unit system.									
	Transmission lines. Direct, inverse and zero-sequence impedance calculations. Cables design basics.							3		
	Transformer modelling. Direct, inverse and zero-sequence impedance calculations.					3		3		
	Introduction to the generator modelling.							3		
Course content	Telegrapher equations					3				
broken down in detail by weekly	Analysis of short-circuits. The phase short circuit. Single-	Three-pha: -pole short	se short circuit.   : circuit.	Double		5		3		
class schedule (syllabus)	Earth fault factor. Network current perspective. Relati voltages from different sho	earthing f onships bo ort-circuit ty	rom the short-cil etween currents /pes.	rcuit and		3				
	Power flow analysis					5		3		
	Introduction to the power s stability analysis. Edith Cla	system sta ark methoo	bility studies. St I.	atic		3				
	List of laboratory or design	exercises					LE h	or DE ours		
	Solution of telegraphers equ	uations in	Matlab					3		
	Short-circuit analysis using	the Power	CAD software p	ackage	e			5		
	Fower now analysis using ti ⊠ lectures		AD Soltware pa	скаус				5		
Format of instruction	<ul> <li>seminars and workshop</li> <li>exercises</li> <li>on line in entirety</li> <li>partial e-learning</li> <li>field work</li> </ul>	S	<ul> <li>□ independent</li> <li>☑ multimedia</li> <li>☑ laboratory</li> <li>□ work with m</li> <li>□ (othe</li> </ul>	t assigr entor r)	nments	5				

Student responsibilities								
Screening student	Class attendance	2,5	Research		Practical traini	ng		
proportion of ECTS	Experimental work		Report		Individual wor	k	1,0	
credits for each activity so that the	Essay		Seminar essay		Laboratory excercises		1,0	
ECTS credits is	Tests	0,5	Oral exam		(Other)			
equal to the ECTS value of the course)	Written exam		Project		(Other)			
Grading and evaluating student work in class and at the final exam	There are two midterms and final exams. The first midterm exam is after 7 weeks of ecturing and the second one is after the next 6 weeks. Each midterm test consists of 10 theoretical questions and numerical problems and final tests consist of 10 heoretical questions and numerical problems. In the final exams students that did not bass the midterm exams take part. The midterm and final exams are carried out as written tests. The requirement for passing grade is the positive assessment of aboratory exercises and 50% points on each midterm exam or the final exam. Grade in percentage) is formed according to the formula: Grade(%) = 0,5 (M1 + M2) he activities in percentage: M1, M2 – test results							
Required literature (available in the		Title	)		Number of copies in the library	Availab other	ility via media	
media)	M. Ožegović, K. Ože mreže I, II, VI, Opal	egović, I Comput	Električne energets ing, Split.	ske	10			
Optional literature (at the time of submission of study programme proposal)	-							
Quality assurance methods that ensure the acquisition of exit competences	<ul> <li>Evaluation of res</li> <li>Feedback from s</li> <li>Self-evaluation of</li> <li>Institutional and</li> </ul>	sults in a students of teach non-ins	accordance with th s via surveys ers titutional evaluatic	ne abov ons	ve learning out	comes		
proposer wishes to add)								

NAME OF THE COURSE	ELECTRICAL MACHINES AND TRANSFORMERS								
Code	FENO04	Year of study	2.						
Course teacher	Ivica Jurić-Grgić, Ph.D., Associate Professor	Credits (ECTS)	8						
Associate teachers	Dino Lovrić, Ph.D., Senior Research Assistant	Type of instruction (number of hours)	L 45	S 0	AE 30	LE 15	DE 0		
Status of the course	Obligatory	Percentage of application of e-learning	0	0			10 0		
COURSE DESCRIPTION									
Course objectives Training students for: - permanent adoption and application of basic knowledge in the field of machines and transformers, - managing and regulation of electrical machines and transformers unc									
Course enrolment requirements and entry competences required for the course	None	Jone							
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	Students will be able to: describe basic principles of electrical machines and transformers, recalculate equivalent circuit parameters of a three-phase transformer manage with electrical machines and transformers under load, perform speed control of induction and DC motors, determine and draw a diagram of DC Motor torque-speed characterist								
	Course content				L hours	/ hc	AE hours		
	Introduction. Purpose of transformers, power transformers, construction, ideal and real transformers.						2		
	Magnetic circuit of transformer equivalent circ	3		2					
	Open circuit and short circuit test on transformer, load, transformer losses, three-phase transformers.								
	Introduction in basic princip electromagnetic torque, rot		3		0				
	Windings of electrical mach	nines.			3		4		
	Synchronous machine, cor	struction, basic principles	. <u>.</u>		3		0		
Course content	Synchronous machines op diagram.	eration and characteristics	, phaso	or	3		4		
detail by weekly	Induction machine, constru	ction, basic principles.			3		0		
class schedule (svllabus)	Induction machine equivale	ent circuit and phasor diag eristics.	ram,		3		4		
(0)	Operating characteristics o induction motor.	f a induction motor, single	-phase		3		4		
	DC machine, construction,	basic principles.			3		0		
	Operating characteristics o DC machines.	f a DC motor, armature re	action i	n	3		2		
	Universal motors, brushles		3		0				
List of laboratory exercises							nours		
	Determination of equivalent transformer	circuit parameters of a the	ree-pha	se			3		
	Open circuit and short circu	it test of synchronous gen	erator				3		
	Synchronous generator syn under load	chronization and synchror	nous ge	enerat	or		3		
Determination of induction motor power flow diagram under full load							3		

	Determination of sep	Determination of separately Excited DC Motor no-load and torque-speed 3							
Format of instruction	<ul> <li>lectures</li> <li>seminars and workshops</li> <li>exercises</li> <li>on line in entirety</li> <li>partial e-learning</li> <li>field work</li> </ul>			<ul> <li>□ independent assignments</li> <li>⊠ multimedia</li> <li>⊠ laboratory</li> <li>□ work with mentor</li> <li>□ (other)</li> </ul>					
Studentresponsibiliti es	The presence on lec	tures in ed labor	the amo atory exe	unt of at crcises.	least 7	70% of the times schedu	ıled.		
Screening student	Class attendance	2,5	Researc	h		Practical training			
work (name the proportion of ECTS	Experimental work		Report			Individual work	4,5		
credits for eachactivity so that	Essay		Seminai essay	•		Laboratory exercises	0,5		
ECTS credits is equal to the ECTS value of the course)	Tests	0,2	Oral exa	ım	Preparation for laboratory exercises		0,2		
	Written exam	0,1	Project			(Other)			
Grading and evaluating student work in class and at the final exam	During the semester week of classes, the the entire exam by n At the two final exam midterm tests. If at curriculum that part of exam. The condition for po- part of the curriculur percent) is formed o Rating (%) = $0.1 * L^{V}$ wherein the activity i LV -percentage obta G1, G2 - percentage curriculum given in lo Students who did no last week of August this school year is a students take the en the student has at le The final score (in performula: Rating (%) = $0.1 * L^{V}$ wherein the activity i LV -percentage obta G - percentage obta The final grade is de	there we a second indeterm ms, stud the firs of curric sitive as in at the n the ba $\sqrt{+0.45}$ s expres- ined by ge obtain ectures. at pass the or the fill so-calle tire curric ast 50% ercentage $\sqrt{+0.9^{-5}}$ s expres- ined by ined by	Il be two I at the fil tests. dents tak dents tak ti final e: ulum the ssessmen midterm sis of all * (G1 + 1) ssed in p laborator ned by 1 he exam rst week d commis iculum, a o of entire te) is form * G ssed in p laborator exams of d as follo	midterm rst week e parts kam student ht is that tests or activities G2) ercentag midterm after two of Septe ssion exa nd the c e curricul hed on th ercentag ry exerci i the ent	of the standard of the standar	The first test will be at the exam period. Student of curriculum that did not asses one of the two not have to take on ano udent has at least 50% final exams. The final grading to the formula: ording to: or final exams of the exams can pass the exat chance to take the aso-called commission in for positive assessments of all activities according to: s of all activities according to:	pass by parts of ther final of each grade (in parts of mat the exam in exam all nt is that ng to the		

	Rating         Grade           50% to 61%         sufficient (2)           62% to 74%         good (3)           75% to 87%         very good (4)           88% 100%         excellent (5)					
Required literature (available in the library and via other	Title	Number of copies in the library	Availability via other media			
media)	I. Jurić-Grgić: Lectures, FESB		e-learning portal			
Optional literature (at the time of submission of study programme proposal)	<ul> <li>A. Dolenc: Transformatori I i II, Interna skripta, ETF, Zagreb, 1989.</li> <li>R. Wolf: Osnove električnih strojeva, Školska knjiga, Zagreb, 1985.</li> <li>M. Piotrovskij: Električni strojevi, Tehnička knjiga, Zagreb, 1978.</li> <li>B.S. Guru and H.R. Hiziroglu: Electric Machinery and Transformers,</li> </ul>					
Quality assurance methods that ensure the acquisition of exit competences	Evaluation of students presence on lectures Evaluation of results in accordance with the above learning outcomes Feedback from students via surveys Self-evaluation of teachers					
Other (as the proposer wishes to add)						

NAME OF THE COURSE	ELECTRICAL POWER SWITCHGEARS								
Code	FENO06	Year of study	2.						
Course teacher	Tonći Modrić, <b>Ph.D.,</b> Assistant Professor	Credits (ECTS)	6						
		Type of instruction	L	S	AE	LE	DE		
Associate teachers		(number of hours)	45	0	15	15	0		
Status of the course	Obligatory	Percentage of application of e-learning	0		<u> </u>		<u>-</u>		
	COURSE	E DESCRIPTION							
Course objectives	<ul> <li>Training students for:</li> <li>understanding the basis power switchgears,</li> <li>understanding the conditional state of the conditiona</li></ul>	raining students for: understanding the basic theoretical and practical knowledge in the electrical power switchgears, understanding the concept of different electrical power switchgear types, dimensioning and selection of basic high voltage electrical power switchgear elements, determination of equivalent circuits and impedances of elements in power system,							
Course enrolment requirements and entry competences required for the course	None								
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<ul> <li>specify the role of electrical power switchgears in power system,</li> <li>enumerate different electrical power switchgear types,</li> <li>define the currents relevant for dimensioning the electrical power switchgear elements,</li> <li>specify the basic high voltage elements in the electrical power switchgears,</li> <li>describe the basic faults in the electrical power switchgear,</li> <li>calculate the basic fault currents,</li> </ul>								
	Course content	ž		L	or S	/	٩Ε		
	Role and functions of electrical power switchgears in power system. Different electrical power switchgear types. Basic hig voltage elements and subsystems of electrical power switchgears (classification and graphical symbols)				3	hc	ours 0		
Course content	Stresses of electrical powe electrical current. Basic fau unsymmetrical fault current components.	r switchgear elements cau Ilts. Calculation of symmet ts using the method of syn	ised by rical an nmetric	nd al	5		3		
broken down in detail by weekly	Equivalent short-circuit imp elements.	bedances of power system			4		3		
class schedule (syllabus)	Analysis of typical short-cir Short-circuit current compo	cuit current-time diagram.			1		1		
	Definitions and calculations dimensioning of electrical p thermal and breaking short	s of currents relevant for power switchgear elements -circuit current).	s (peak	,	2		2		
	Voltage stresses of high voltage electrical power switchgear elements. Standard nominal and highest voltages used in power system. Overvoltages. Standard withstand voltages and testing procedures. Insulation coordination. Grounding of power system pourtal point					3 1			
	Basic high voltage electrica	al power switchgear eleme	nts.		8		2		

	Busbar system conc	epts, cir	cuit config	guratior	าร.		3	0
	The structure of typic	cal elect	trical powe	er switc	hgear b	bays.	1	0
	The auxiliary electric elements of seconda their functions (meas signalling).	al powe ary syste suremer	er switchge ems. The a nt, protecti	ear sys auxiliar on, cor	tems. T y circuit ntrol, int	ypes and s and erlocking,	4	1
	Sources and distribute electrical power swit	tion of t	he auxiliar systems.	ry volta	iges in t	he	2	0
	Typical layouts of ele	ectrical	power swit	tchgea	rs.		3	0
	List of laboratory or	design e	exercises					LE or DE hours
	Unsymmetrical load	of two-w	inding pov	wer tra	nsforme	ers.		3
	Unsymmetrical load of	Unsymmetrical load of three-winding power transformers.						3
	Measurement of pow	er trans	former im	pedano	ces.			3
	Jurrent transformer.							3
				es un a	a compt	liei.		3
	$\square$ seminars and wo	kshons		⊠ inde	pender	nt assignme	nts	
		Kanopa		🗆 muli	timedia			
Format of instruction	$\square$ on line in entirety							
	□ partial e-learning			$\Box$ work with mentor				
	$\Box$ field work				(othe	er)		
Student responsibilities	The presence on lectures in the amount of at least 70 % of the times scheduled. Performed all required laboratory exercises and submitted all written reports with measurement and calculation results.							
Screening student	Class attendance	1,7	Research	า	Practical tra		aining	
work (name the proportion of ECTS	Experimental work		Report Ind		Individual v	vork	3,0	
credits for each activity so that the	Essay		Seminar essay			Laboratory	exercise	es 0,6
total number of ECTS credits is	Tests	0,2	Oral exam			Preparation for laboratory exercises		0,4
value of the course)	Written exam	0,1	Project			(Oth		
Grading and evaluating student work in class and at the final exam	vvritten exam $0,1$ Project(Other)There are two midterms and final exams. The first midterm exam is after 7 weeks of lecturing and the second one is after the next 6 weeks. Each midterm test consists of 3 theoretical questions and 1 numerical problem. Each final test consists of 6 theoretical questions and 2 numerical problems. In the final exams students that did not pass the midterm exams take part. The midterm and final exams are carried out as written tests. The requirement for passing grade is the positive assessment of laboratory exercises with submitted all written reports and 50 % points on each midterm exam or the final exam. Grade (in percentage) is formed according to the formula: Grade (%) = 0,05 NP + 0,05 LV + 0,45 (M1 + M2) the activities in percentage: • NP – attendance at lectures, • LV – laboratory assessment, • M1, M2 – midterm test results.The final grade is determined as follows: • 50 - 61 % sufficient (2) • 62 - 74 % good (3) • 75 - 87 % very good (4)							
Required literature (available in the		Title	)			Number copies i the libra	of n ry otl	ilability via ner media

library and via other media)	T. Modrić: Autorizirana predavanja, FESB	e-learning portal						
	T. Modrić: Autorizirane auditorne vježbe, FESB	e-learning portal						
	I. Medić, E. Sutlović: Električna postrojenja, upute za laboratorijske vježbe, Redak, Split, 2014.	webknjizara.hr						
Optional literature (at the time of submission of study programme proposal)	<ul> <li>H. Požar: Visokonaponska rasklopna postrojenja, Tehnička 1990.</li> <li>K. Meštrović: Sklopni aparati srednjeg i visokog napona, G 2007.</li> <li>R. Milošević: Vakuumski električni sklopni aparati, Graphis,</li> <li>A. Dolenc: Transformatori, Sveučilište u Zagrebu, 1968.</li> </ul>	<ul> <li>H. Požar: Visokonaponska rasklopna postrojenja, Tehnička knjiga, Zagreb, 1990.</li> <li>K. Meštrović: Sklopni aparati srednjeg i visokog napona, Graphis, Zagreb, 2007.</li> <li>R. Milošević: Vakuumski električni sklopni aparati, Graphis, Zagreb, 2011.</li> <li>A. Dolanc: Transformatori, Sveučilište u Zagrebu, 1968.</li> </ul>						
Quality assurance methods that ensure the acquisition of exit competences	<ul> <li>Evaluation of student presence on lectures</li> <li>Evaluation of results in accordance with the above learning out</li> <li>Feedback from students via surveys</li> <li>Self-evaluation of teachers</li> <li>Institutional and non-institutional evaluations</li> </ul>	comes						
Other (as the proposer wishes to add)	-							

NAME OF THE COURSE	ELECTRICAL SAFETY								
Code	FENO15	Year of study	3.						
Course teacher	Ivica Jurić-Grgić, Ph.D., Associate Professor	Credits (ECTS)	5						
Associate teachers		Type of instruction (number of hours)	L S AE 30			LE 30	DE		
Status of the course	Obligatory	Percentage of application of e-learning	0						
	COURSE	DESCRIPTION							
Course objectives	<ul> <li>Training students for:</li> <li>permanent adoption ar protective measures ag</li> <li>adoption of the method working with electrical</li> <li>testing of electrical inst</li> </ul>	nd understanding of the mo gainst electric shock, dology, procedures and mo equipment, machinery and tallation	ost imp easure: d plants	oortant s for pi s.	techn rotecti	cal on whe	ən		
Course enrolment requirements and entry competences required for the course	None	lone							
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<ul> <li>Students will be able to:</li> <li>explain the danger of possible electric shock on low and high voltage facilities,</li> <li>describe and define the most important technical protective measures against electric shock on low and high voltage facilities,</li> <li>examine the validity of protection against direct and indirect contact in low voltage and high voltage installations,</li> <li>examine the validity of protection against overloads and short circuits in electrication.</li> </ul>								
	Course content					Lh	ours		
	Effect of electrical current of	on the human body.					2		
	Types of hazards associated with electrical current: direct contact, indirect contact, transferred potential, induced voltages, electric arc, static electricity, residual charge, lightning strikes, effect of electrical and magnetic fields on the human body								
	Technical safety performance of low voltage installations. Types of low voltage systems, grounding, grounding protection against direct or indirect contact, simultaneous protection against direct or indirect contact.						6		
Course content broken down in	Protection by electrical s voltage system, protect overvoltage. Special prote limited conductive area.	eparation, overvoltage pr ion against atmospher ection measures on con	otectic ic an structic	on fror d sw on site	n high itching is and	n J I	4		
detail by weekly	l echnical safety in high vo	Itage installations.					2		
class schedule	Overnead lines, safety dist	ances and neights. Ground	uing of	colum	ns.	-	2		
(syllabus)	Rules and safety measures	s when working on electric		allation	5.		∠ 2		
	Safety measures when wo	rking on overhead lines of	ables a	iailis. Ind in			۷		
	underground facilities. Live	line working.					2		
	List of laboratory exercises	i				LEI	nours		
	Conductor continuity meas	urement					3		
	Insulation resistance meas	urement					3		
	Fault loop impedance mea	surement					3		
	Line impedance and prosp	Devices	measu	iremer	IT	-	<u>ა</u>		
	Lesting of RCD Protection Devices								
	Farth Resistivity Measuren	nent					3		
							5		

	Leakage Current Me	asurem	Leakage Current Measurement						
	Technical safety in h	high volt	age insta	llations	(field w	ork)	6		
Format of instruction	<ul> <li>seminars and workshops</li> <li>exercises</li> <li>on linein entirety</li> <li>partial e-learning</li> <li>field work</li> </ul>			<ul> <li>□ independent assignments</li> <li>⊠ multimedia</li> <li>⊠ laboratory</li> <li>□ work with mentor</li> <li>□ (other)</li> </ul>					
Studentresponsibiliti es	The presence at the required laboratory e	lectures	s at least s.	70% of	the tim	es scheduled. Perforn	ned all		
Screening student	Class attendance	1	Researc	:h		Practical training			
proportion of ECTS	Experimental work		Report			Independent work	2,5		
eachactivity so that	Essay		Seminai essay			Laboratory exercises	1		
ECTS credits is	Tests	0,2	Oral exam			Preparation for laboratory exercises	0,2		
value of the course)	Written exam	0,1	Project			(Other)			
Grading and evaluating student work in class and at the final exam	During the semester week of classes, the the entire exam by n At the two final exa midterm tests. If at curriculum that part exam. The condition for po part of the curriculur percent) is formed o Rating (%) = $0.1 * L^{1}$ wherein the activity i LV -percentage obta G1, G2 - percentage curriculum given in lo Students who did not last week of August this school year is a students take the en the student has at le The final score (in per formula: Rating (%) = $0.1 * L^{1}$ wherein the activity i LV -percentage obta G - percentage obta The final grade is de Rating Grade	there w e second nidterm ms, stud of curric sitive as n at the n the ba $\sqrt{+0.45}$ s expres ined by ge obtai ectures. at pass the or the fill so-calle tire curr ast 50% ercentag $\sqrt{+0.9^{+2}}$ s expres ined by ined by ined by	ill be two l at the fi tests. dents tak st final e: wilum the ssessmen midterm sis of all s * (G1 + ssed in p laborator ined by he exam rst week d commis iculum, a o of entire ue) is form * G ssed in p laborator exams of d as follo	midterr rst weel e parts xam stu studen nt is that tests o activitie G2) ercenta ry exerc midterr after two of Septo ssion ex nd the o e curricu ned on t ercenta ry exerc the ent ws:	n tests. k of the of the udent p t does r at the st r at the st r at the s accor ge acco sises, n tests ro final e ember. cam. In conditio ulum. he basis ge acco sises, tire curr	The first test will be at exam period. Student curriculum that did no asses one of the two not have to take on an udent has at least 50° final exams. The fina ding to the formula: ording to: or final exams of the exams can pass the ex Last chance to take the a so-called commission n for positive assessments of all activities accord ording to: iculum given in lecture	the eighth the eighth can pass of pass by o parts of other final % of each I grade (in grade (in e parts of kam at the le exam in n exam all lent is that ding to the ess.		

	50% to 61% sufficient (2) 62% to 74% good (3) 75% to 87% very good (4) 88% 100% excellent (5)						
Required literature (available in the library and via other	Title	Number of copies in the library	Availability via other media				
media)	I. Jurić-Grgić: Lectures, FESB		e-learning portal				
Optional literature (at the time of submission of study programme proposal)	E. Mileusnić: Ispitivanje električnih instalacija niskog napona, ZIRS, Zagreb, 2006. Siemens: Electrical Instalation Handbook-Third Edition,(Editor: Gunter G Seip) John&Wiley, 2000.						
Quality assurance	- Evaluation of students presence on lectures						
methods that ensure	- Evaluation of results in accordance with the abov	e learning out	comes				
the acquisition of	<ul> <li>Feedback from students via surveys</li> </ul>						
exit competences	<ul> <li>Self-evaluation of teachers</li> <li>Institutional and non-institutional evaluations</li> </ul>						
Other (as the proposer wishes to add)							

NAME OF THE COURSE	ELECTROMAGNETIC COMPATIBILITY										
Code	FELO21	Year of study	3.								
Course teacher	Vicko Dorić, Ph.D., Associate Professor	Credits (ECTS)	5								
Associate teachers	Maja Škiljo, Ph.D.	Type of instruction (number of hours)	L 30	S 0	AE 0	LE 30	DE				
Status of the course	Elective	Percentage of application of e-learning	0								
	COURSE	E DESCRIPTION									
Course objectives	<ul> <li>Training students for:</li> <li>understanding of basic</li> <li>understanding of basic</li> <li>and technics used for i</li> <li>interpreting governing</li> <li>analyzing EMC problet</li> <li>measuring radiated EM</li> </ul>	principles of electromagn principles of electromagn ts suppression, EMC standards ms using adequate compu fields both on high and lo	etic con etic cou tational	npatib Ipling mode	ility (E betwe els,	MC), en sys	stems				
Course enrolment requirements and entry competences required for the course	undamentals of Electrical Engineering1 & 2.										
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<ul> <li>Students will be able to:</li> <li>define the fundamenta</li> <li>classify types of the ele</li> <li>recognize potential EN</li> <li>measure radiated EM f</li> <li>calculate basic parame models,</li> <li>use commercial antenr programs,</li> <li>compare results obtain standards.</li> </ul>	<ul> <li>Students will be able to:</li> <li>define the fundamental terms in electromagnetic compatibility,</li> <li>classify types of the electromagnetic interference,</li> <li>recognize potential EMC problems in practical situations,</li> <li>measure radiated EM fields both on high and low frequencies.,</li> <li>calculate basic parameters of the internal dosimetry using simple human body</li> <li>models,</li> <li>use commercial antenna simulation software for the analysis of the EMC</li> <li>programs,</li> <li>compare results obtained by calculations or measurement with relevant EMC</li> </ul>									
	Course content			l	or S	/ hc	AE ours				
	Introduction to the enginee compatibility.	ring modeling and electror	nagneti	С	2		0				
	Historical overview of EMC	modeling.			2		0				
	Classification of the EMC p	problems.			2		0				
	Signal spectrum, radiated	emissions and susceptibilit	ty.		2		0				
	Conducted emissions and	susceptibility.			2		0				
	European and Internationa	I standards.			2		0				
Course content	Low frequencies (LF) mode	els with concentrated para	neters.		2		0				
broken down in	Wire antenna analysis in th	e EMC applications	eleis.		2		0				
detail by weekly	Transmission line models				2		0				
class schedule	Humans and equipment pr	otection from EM radiation			2		0				
(syllabus)	Lightning protection system	ns. aroundina systems.			2		0				
	Electromagnetic compatibi systems.	lity of collocated radio tran	smissio	n	2		0				
	List of laboratory or design	exercises				LE o	or DE ours				
	Cable losses measurement	•					3				
	Frequency characteristics of	of the electronic circuits					3				
	Non ideal behavior of the e	lectronic components.					3				
	Modulations and modulator	S.					3				
	Crosstalk in cables.						3				

	Noise measurement	using in	duction.	se measurement using induction. 3						
	Shielding.						3			
	Calibration of electric	and ma	agnetic fie	eld measureme	nt probes.		3			
	Measurement of elec	stric and	magneti	c field of the tra	nsformer station	). •!!	3			
		suremer	it of the a	intenna parame	ters in GTENICE	ell.	3			
Format of instruction	<ul> <li>□ seminars and wor</li> <li>□ semicars and wor</li> <li>□ exercises</li> <li>□ on line in entirety</li> </ul>	kshops		⊠ independen □ multimedia ⊠ laboratory	⊠ independent assignments □ multimedia ⊠ laboratory					
	□ partial e-learning			□ work with mentor						
	□ field work			□ (othe	r)					
Student responsibilities	The presence on lect Performed all require	he presence on lectures in the amount of at least 70 % of the times scheduled. erformed all required laboratory exercises.								
Screening student	Class attendance	2,0	Researc	h	Practical trainin	g				
proportion of ECTS	Experimental work		Report		Individual work		2,0			
activity so that the	Essay		Seminai essay		Laboratory exer	rcises	0,5			
ECTS credits is	Tests	0,2	Oral exa	ım	Preparation for laboratory exerc	cises	0,2			
value of the course)	Written exam	0,1	Project		(Other)					
Grading and evaluating student work in class and at the final exam	where M1 and M2 and both midtering and the set take tests they didn't min. and consists of are required to finish both midterm exams where M1 and M2 and Final grade is determ Score Graa 50% to 62% suffi 63% to 75% good 76% to 88% very 89% to 100% exce In the final exams st is performed in the v or problems. In orde total points. The final There is possibility to	re midte nined ac de cient (2) d (3) good (4 ellent (5) udents t vritten fo r to pass l grade o take a	e is after n the mic stions or oratory ex- core is d Score(% rm exam ccording t ccording t ) ake tests orm. It lass is then de seminar	the next 6 wee therm exams. Be problems. In or ercises and ga etermined in fol b) = 0,5 (M1 + N s score. the final score: the final score: the final score for the for m, students are etermined as ex- instead of the t	example a consistent of the second se	m exam of tota	ms. Exam questions ist 50% of			
	Clayton D. Davis !!!	Title	tion to 5	lootromostastis	Number of copies in the library	Availa othe	ıbility via r media			
Required literature (available in the library and via other media)	Compatibility", Wiley Dragan Poljak: "Adv computational electr	<u>v, New J</u> anced n omagne	ersey, 20 nodeling i tic comp	n atibility", Wiley						
	Poljak, D., Dorić, V., žičanih antena primj 2009.	Antonij enom ra	ević S.: N ičunala, ł	lodeliranje Kigen, Zagreb,						

Optional literature (at the time of	1.	D.Poljak, <i>Teorija elektromagnetskih polja s primjenama u inženjerstvu</i> , Šk. knjiga Zagreb, 2014.
submission of study	2.	Tesche, F.M.: Ianoz, M.V., Karslsson, T.: EMC Analysis Methods and
programme		Computational Models, John Wiley & Sons, 1997
proposal)	3.	Macnamara, T.: Handbook of Antennas for EMC, Artech House, 1995.
Quality assurance	-	Evaluation of results in accordance with the above learning outcomes
methods that ensure	-	Feedback from students via surveys
the acquisition of	-	Self-evaluation of teachers
exit competences	-	Institutional and non-institutional evaluations
Other (as the		
proposer wishes to		
add)		

NAME OF THE COURSE									
Code	FELO27	Year of study			2				
Course teacher	Mojmil Cecić, Ph.D., Full Professor	Credits (ECTS)			5				
Associate teachers	-	Type of instruction (number of hours)	L 30	S 0	AE 0	LE 30	DE 0		
Status of the course	Obligatory	Percentage of application of e-learning			0				
	COURSE	E DESCRIPTION							
Course objectives	Training students for: - application of the c - use of the compute control systems, - use of the compute electronics circuits	computer in electronics, er in analyses and synthes er in analyses and synthes	is of the is of the	e linea anal	ir and og and	nonlin 1 digita	iear al		
Course enrolment requirements and entry competences required for the course	lone								
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<ul> <li>Students will be able to: <ul> <li>use VISSIM to the analyses and synthesis of the linear and nonlinear control systems,</li> <li>use MATLAB - Simulink to the analyses and synthesis of the linear and nonlinear control systems,</li> <li>solve the complex tasks of simulation of the linear and nonlinear control systems,</li> <li>use EWB to simulation the different electronics circuits,</li> <li>use PROTEL to simulation the different electronics circuits,</li> </ul></li></ul>								
	Course content				or S	/ hc	AE ours		
	Introduction, application of	computer in electronics			1				
	VISSIM: outlines, basic ele	ments and their characteri	stics		1				
	VISSIM: operations with bl mathematical operations	ocks, simulation properties	, basic		2				
	VISSIM: advanced mathen integration, solving differen	natical operations, differen itial equations	tiation,		2				
Course content	VISSIM: work with complex blocks, animation	x systems, work with comp	ound		2				
broken down in	Analyse and syntheses usi	ng VISSIM			2				
detail by weekly	characteristics		÷11		1				
(syllabus)	mathematical operations, c differential equations	tical operations, advanced differentiation, integration, s	on solving		2				
	ELECTRONIC WORKBEN elements and their charact	ICH (EWB): outlines, basic eristics			1				
	ELECTRONIC WORKBEN electronic circuits	ICH (EWB): simulation of the	ne analo	og	2				
	ELECTRONIC WORKBEN electronic circuits (TTL)	ICH (EWB): simulation of the	ne digita	al	2				
	ELECTRONIC WORKBEN electronic circuits (CMOS)	ICH (EWB): simulation of the	ne digita	al	2				

	PROTEL (Schematic	2						
	PROTEL (PCB Edito	or): outli	nes, basi	c eleme	ents and	their		
	characteristics						2	
	PROTEL: simulation	of the a	analog ar	d digita	l electro	onic	2	
								LE or DE
	List of laboratory or o	design e	exercises					hours
	VISSIM: operations v	vith bloc	cks, simu	ation p	opertie	s, basic		2
	VISSIM: simulation o	f simple	systems					2
	VISSIM: simulation o	f comple	ex syster	าร				3
	MATLAB – Simulink:	operati	ons with	olocks,	simulati	on propertie	es, basic	2
	mathematical operati	ons	ion of oin		tomo			-
	MATLAB – Simulink. MATLAB – Simulink:	simulat	ion of co	nplex s	vstems			2
	EWB: Analog Circuit	s Desigr	<u>า</u>		jeterne			3
	EWB: Digital Circuits	Design						3
	PROTEL: Schematic	Editor						3
	⊠ lectures	kebone		🗵 inde	pender	it assignmei	nts	
		ksnops		🗆 mult	timedia			
Format of instruction	$\Box$ on line in entirety			⊠ labo	ratory			
	□ partial e-learning							
	□ field work □ (other)							
Student	The presence on lec	tures in	the amo	unt of a	t least 7	0 % of the t	times sche	eduled.
responsibilities	Performed all require	ed labor	atory exe	rcises.		1		
Screening student work (name the	Class attendance	2	Research			Practical tra	aining	
proportion of ECTS	Experimental work		Report			Individual work		2,5
activity so that the	Essay		Semina essay	•	0,2	(Other)		
ECTS credits is	Tests	0,2	Oral exa	ım		(Oth	ner)	
equal to the ECTS value of the course)	Written exam	0,1	Project			(Oth	ner)	
	There are two midte	rms and	final exa	ms. Th	e first m	nidterm exar	m is after	7 weeks of
	lecturing and the sec	cond on	e is after	the nex	t 6 wee	KS.		
	The requirement for	passing	grade is	the posi	itive ass	essment of	laboratory	v exercises
	and 50% points on e	each mi	dterm ex	am or tl	ne final	exam. Grac	de (in perc	centage) is
	formed according to	the forn	nula: lo [%] -0	25*I ⊥0	375* (1	/1 ± M2)		
	where L is laboratory	v assess	sment an	23 L∓0 d M1 ar	.373 (n nd M2 a	re the result	ts of the m	nidterm
Grading and	exams in percentage	<i>)</i> ∋.						
evaluating student						line and fire		alata af A
the final exam	Each midterm test	The rec	s or 2 pr	t for na	ning tas	rade is 50%	of the tot	al number
	of questions. The stu	udents v	vho did n	ot pass	the mid	term exams	take part	in the final
	exam. Finally grade	is deter	mined as	follows	:			
	from 50% to	62.5% -	· dovoljar dobar (2	(2)				
	from 75% to	87.5% -	· vrlodoh	'' ar (4)				
	from 87.5% t	o 100%	- izvrsta	n (5)				
	ivildterm and final ex	ams are	e held in t	ne term	is provi	ded by the t	ime table.	

Required literature	Title	Number of copies in the library	Availability via other media			
(available in the	VISSIM, User Guide	1				
library and via other	MATLAB – Simulink, User Guide	1				
media)	Electronics Workbench, User Guide	1				
	Cecić, M., PROTEL, authorized lectures		e-learning portal			
Optional literature (at the time of submission of study programme proposal)	<ul> <li>V. Zanchi, M. Cecić, M. Cecić: Programska podrška linearnoj teoriji automatske regulacije, FESB – Split, 1990.</li> <li>V. Zanchi, A. Raguž: Simulacija u MATLABu, FESB – Split, 1998.</li> </ul>					
Quality assurance methods that ensure the acquisition of exit competences	Evaluation of results in accordance with the above learning outcomes Feedback from students via surveys Self-evaluation of teachers					
Other (as the proposer wishes to add)						

NAME OF THE COURSE		ONIC CIRCUITS DESIGN								
Code	FELO47	`	Year of s	tudy		3.				
Course teacher	Ivan Marinović, Ph.D Professor	. Full	Credits (E	ECTS)		5				
Associate teachers	Duje Čoko, Ph.D.	-	Type of ir	nstructio	on s)	L	S	AE	LE	DE
Status of the course	Flective		Percenta	ge of	-)	15		15	30	
			applicatio	n of e-l	earning					
		URSE	DESCRI	PHON						
Course objectives	<ul> <li>raining students for</li> <li>synthesis of elec</li> <li>analysis of comp</li> <li>projecting of sim</li> </ul>	: stronic c plex elec ple elec	ircuits ctronic cir ctronic de	cuits vice						
Course enrolment requirements and entry competences required for the course	Finished coarse <i>Elec</i>	ctronic c	circuits							
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<ul> <li>Students will be able</li> <li>design electronic</li> <li>construct a proto</li> <li>make measurem analyzers</li> <li>understand princ</li> </ul>	<ul> <li>design electronic circuits</li> <li>construct a prototype of the projected circuit</li> <li>make measurements of electronic parameters applying oscilloscopes and analyzers</li> <li>understand principles of operation of more complex circuits</li> </ul>								
	Course content							L or S hours	h	AE ours
	Cutoff frequencies as parameters for synthesis							 1		2
	Design of feedback amplifiers							1		1
	Operational amplifiers, slew-rate. LM741							3		3
Course content	C-class, D-class and	E-class	s power a	amplifie	rs			2		2
detail by weekly	Energy converters, re	ectifiers	and stat	oilizers o	of voltag	ge, LM7	23	3		3
class schedule	Switching regulators							1		1
(syllabus)	Timers, NE555							1		1
	Oscillators							1		1
	List of laboratory or o	design e	exercises							or DE
	Electronic project: construction of given electronic circuit (design simulation, PCB design and construction, soldering of componer measurements on the device final report)							s,	;	30
Format of instruction	Industrient of the dorree, that reporty         Image: lectures         Image: seminars and workshops         Image: lectures         Image: lectures     <									
Student responsibilities	The presence on lect scheduled. Performe	tures ar ed all ree	nd exercis	ses in th	ne amou v exercis	unt of at ses.	least	70% o	f the t	imes
Screening student	Class attendance	2	Researc	:h	_	Practic	Practical training			
proportion of ECTS	Experimental work		Report			Exercis	ses			1

credits for each activity so that the	Essay		Seminar essay		Individual work	K	2		
total number of ECTS credits is	Tests		Oral exam		(Other)				
equal to the ECTS value of the course)	Written exam		Project		(Other)				
Grading and evaluating student work in class and at the final exam	The course should the absolute gradin	e course should be graded according to outcomes of the project and oral exam. e absolute grading is applied.							
Required literature (available in the		Title					ility via nedia		
library and via other media)	P. Biljanović: Elektro Zagreb	5							
	U. Tietze, C. Schenł	k, Advar	nced electronics	circuits					
Optional literature (at the time of submission of study programme proposal)									
Quality assurance methods that ensure the acquisition of exit competences	<ul> <li>Evidence of stud</li> <li>Annual analysis</li> <li>Teachers self-evid</li> <li>Students feedbal</li> </ul>	<ul> <li>Evidence of students attendance</li> <li>Annual analysis of grades achieved</li> <li>Teachers self-evaluation</li> <li>Students feedback via guestionnaires and surveys</li> </ul>							
Other (as the proposer wishes to add)									

NAME OF THE COURSE	ELECTRONIC CONVERT	ELECTRONIC CONVERTERS FOR POWER SUPPLIES									
Code	FENO21	Year of study	3								
Course teacher	Dinko Vukadinović, Ph.D., Full Professor	Credits (ECTS)	5								
	Mateo Bašić, Ph.D.	Type of instruction	L	S	AE	LE	DE				
Associate teachers	Assistant Professor Ivan Grgić, Assistant	(number of hours)	30	0	15	15	0				
Status of the course	Obligatory	Percentage of application of e-learning	0								
	COURS	E DESCRIPTION	1								
Course objectives	Training students for: - understanding of basic pr	inciples of electronic conv	erters f	or pow	er sup	plies					
Course enrolment requirements and entry competences required for the course	None		Iveners			ipplies					
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<ol> <li>1) Explain the operating principles of electronic converters in the linear and switch mode</li> <li>2) Describe the characteristics of electronic converters components</li> <li>3) Analyze single-phase half-wave diode rectifier loaded with the capacitor and the resistor</li> <li>4) Analyze the impact of the power transformer leakage inductance on the natural commutation in the single-phase bridge rectifier</li> <li>5) Calculate the minimal inductance in the DC-DC converters which ensures the operation in continuous mode</li> <li>6) Discuss the current and voltage waveforms in isolated DC-DC converters</li> <li>7) Derive the voltage transfer ratio for isolated DC-DC converters</li> <li>8) Explain the active power factor correction</li> <li>9) Compare the UPS systems which operate in normal mode of operation. in stored-</li> </ol>										
	Course content				L hours	h	AE ours				
	Introduction. Schemes of e	electronic converters for po	wer		1		_				
	Components of electronic of	converters for power suppl	ies		1						
	Diode rectifiers				3		3				
	Switch-mode non-isolated buck-boost, Ćuk and bridge	DC-DC converters (buck, e)	boost,		3		4				
Course content	Switch-mode isolated DC-I push-pull, half-bridge and b	DC converters (forward, fly pridge)	/back,		6		4				
broken down in	Single-phase and three-ph	ase inverters			4		3				
detail by weekly	Frequency converters				2						
(svllabus)	Active and passive power f	actor correction			2		1				
(0)	Uninterruptable power sup		2								
	Examples of electronic con electric power generation		2								
	List of laboratory exercises					h	LE ours				
	Single-phase half-wave dio	de rectifier					4				
	Single-phase full-wave dioc	le rectifier					4				
	Non-isolated DC-DC boost	converter					4				
	Non-isolated DC-DC buck-b	poost converter					3				

	Speed control system	of a se	parately	-excited DC	moto	r		3	
	x lectures		v independent assignments						
	□ seminars and work	kshops		⊠ multime	dia	Sagrimenta			
Format of instruction	⊠ exercises			x laboratory					
	□ <i>on line</i> in entirety			□ work wit	, h mer	ntor			
	□ partial e-learning	(other)							
Otudant		uree in	<u> </u>		at 70	0/ of the time of		al	
responsibilities	Performed all require	d labora	atory exe	ercises.	St 70	% of the time	s schedule	ed.	
Screening student work (name the	Class attendance	1	Resear	ch		Practical trai	ining		
proportion of ECTS credits for each	Experimental work		Report			Individual work		2	
activity so that the total number of	Essay		Semina	r essay		Laboratory e	exercises	1	
ECTS credits is	Midterm exams	0.3	Oral exa	am		Auditory exe	ercises	0.5	
value of the course)	Written exam	0.2	Project			(Other)			
	During the semester, and the second after either theoretical or course which they did	, two mi 13 weel numeric d not pa	dterm ex <s lect<br="" of="">cal. In th ss in the</s>	ams are he ures. Each r e final exar midterm ex	eld - th midter ms, st cams.	ne first after 7 rm exam cons tudents take	weeks of sists of 4 pr those part	lectures oblems, s of the	
	The requirement for passing grade is that the sum of the laboratory exercises' grade (L) and the midterms' grades (M1 and M2), expressed as a percentage, is $50\%$ or more. The sum is calculated as								
	Grade (%) = 0.25L + 0.375(M1 + M2)								
	where the number of points achieved in each midterm exam has to be at least 50%.								
Grading and evaluating student work in class and at the final exam	The students that do not pass the midterm exams take the final written exam which consists of 4 problems. The requirement for a positive evaluation of the final exam is at least 50% points achieved. In the final exam, the students that did not pass one of the midterm exams are presented with 4 problems from the corresponding part of the course. Subsequently, the grade is determined as follows:								
	Grade (%) = 0.25L + 0.75(I)								
	where I is the numbe	r of poir	nts achie	ved in the fi	nal w	ritten exam (a	at least 50%	%).	
	The final grade for th	e cours	e is dete	rmined as fo	ollows	:			
	50% to 61% - Suffici 62% to 74% - Good 75% to 87% - Very g 88% 100% - Exceller	ient (2) (3) good (4) nt (5)							
Doguized literature						Number of	Availabi	lity via	
Required literature		Title				copies in	other n	nedia	
library and via other			·		YI.:	the library			
media)	pretvarači za napajar	bavanja nje, šk. g	iz koleg god. 201	ija Elektroni 4/15.	СКІ		e-learning	g portal	
Optional literature	Hase, Y.: Handbook	of powe	er system	ns engineeri	ng wit	th power elec	tronics		
(at the time of submission of study programme proposal)	applications, John W Emadi A., Nasiri A., E Filters, CRC Press, N	iley, 20 Bekiarov New Yor	13. / S. B.: L k, 2005.	Ininterruptal	ble Po	ower Supplies	and Active	e	
Quality assurance	- Keeping records	of stude	ent atten	dance					
methods that ensure	- Annual analysis	of the pe	erforman	ice at midter	rm ex	ams and final	exams		
the acquisition of exit competences	<ul> <li>Feedback from students via surveys</li> <li>Self-evaluation of teachers</li> <li>Feedback from graduated students</li> </ul>								
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Other (as the proposer wishes to add)									

NAME OF THE COURSE	ELECTRONIC INSTRUM	ENTATION						
Code	FELO20	Year of study	3					
Course teacher	Ivan Marasović, Ph.D. Assistant Professor	Credits (ECTS)	5					
Associate teachers		Type of instruction (number of hours)	L 15	S	AE 0	LE 45	DE	
Status of the course	Elective	Percentage of application of e-learning						
	COURSE	DESCRIPTION						
Course objectives	<ul> <li>Training students for:</li> <li>Understanding the main microcontrollers in inst</li> <li>Signal acquiring and control representation.</li> <li>Development of digital microcontroller.</li> </ul>	in properties of digital instr rumentation. onditioning, analog to digit instrumentation chain bas	ument al conv ed on	ation c version the AV	hain u , data ′R ATI	sing MEL se	eries	
Course enrolment requirements and entry competences required for the course	None.							
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<ul> <li>Students will be able to:</li> <li>State the basic principl</li> <li>Choose the basic perip system.</li> <li>Programing microcontr</li> <li>Acquisition, conditionin microcontrollers.</li> <li>Send processed data t representation on the a</li> </ul>	es of microcontrollers. oheral components necess collers in assembler and C. og and processing physica o computer using serial co alphanumerical 16x2 displa	ary for I signa ommun	microo Is by u ication	contro sing (RS2	llers b 32) an	ased d	
	Course content					Lh	ours	
	Introduction. Digital instrum	nentation chain based on t	he				1	
	Microcontrollers. Microcontroller and microprocessors. Microprocessors architecture. Program counter, instructions and operation code, pipeline and status register. Memory organization and buses							
	ATmega16 microcontroller architecture (internal modules, IO ports, timer/counter, USART, ADC). Registers and memory organization and addressing.						1	
Course content	System clock and clock op System control and reset.	tions. Power management	and s	leep m	odes.		1	
broken down in detail by weekly class schedule	General purpose input-outp and input register. Alternate modes of operation. Timer/	out pins, data direction reg e port functions. Timer/cou /counter interrupt vectors.	ister, c inter m	lata reg iodules	gister s and		1	
(syllabus)	Universal Synchronous and Transmitter (USART) for se description. Baud rate setti	d Asynchronous serial Rec erial communication. USAI ng.	ceiver a RT reg	and ister			1	
	Memory programing, memory signature and calibration by	ory and data memory lock yes. Parallel, serial and JT	bits. F AG pro	use bit ogrami	s, ng.		1	
	Microcontroller peripheral c	components, supply, reset	and cl	ock so	urce		1	
	Digital instrumentation cha processing. Noise and met	in. Acquiring, conditioning hod for noise cancelling.	and si	gnal			1	
	Analog circuits in instrumer analog-digital converters.	ntation chain, amplifiers, fi	lters, b	ridges	and		1	

	Data representation, LED, seven segment display, LCD alphanumerical and graphic display. Development of custom defined symbols. Connecting display to microcontroller, initialization and communication.							1
	Standard communic (RS232) SPL TWI//	ation int	erfaces in WIFL F	n digital	instrum t IrDA	nentation, USART		1
	ARM microcontroller	s and p	rocessor	s. Archi	tecture	and mode of		1
	List of laboratory or	design e	exercises				LE ł	nours
	Introduction to Atme	el studio	and ST	K500.	I/O pins	configuration, LED		c
	blinking examples in	assemb	oler and C	).	-	_		0
	Program, data and E	EPROM	1 memory	vusing.				6
	Timer/counter application	ation. In	terrupts g	generate	ed by tir	ner/counter.		6
	Executing program -	monitor	ing modu	le (wate	chdog ti	mer).		6
	Using serial standard	I RS232	, connec	ting mic	rocontr	oller to computer.		6
	Analog comparator n	nodule a	applicatio	<u>n.</u>				6
	Using alphanumerica	al 16x2 c	display ar	nd LM3	<u>5 tempe</u>	rature sensor.		3
	Connecting display a	ind temp	perature :	sensor	to micro	controller and digital		6
	thermometer develop	oment.						_
				⊠ inde	pender	t assignments		
	□ seminars and wor	kshops		🛛 muli	timedia	<b>9</b>		
Format of instruction	exercises			⊠ labo	ratory			
i office of modificient	□ <i>on line</i> in entirety				k with m	ontor		
	□ partial e-learning				rk with mentor			
	☐ field work							
Student	Students should atte	end at le	ast 70%	of the le	ectures.	Students must comp	lete a	all
responsibilities	laboratory exercises	•						
Screening student work (name the	Class attendance	0,5	Researc	h		Practical training		
proportion of ECTS credits for each	Experimental work		Report			Individual work		1.75
activity so that the	Essay		Seminal essay	•		Laboratory exercises		1,5
ECTS credits is	Tests	0.15	Oral exa	ım		Preparation for laboratory exercises		0.25
value of the course)	Written exam	0.1	Project		0,75	(Other)		
Grading and evaluating student work in class and at the final exam	There are two midter after 7 weeks of cla midterm exam is w problems. Each mid should score at leas the laboratory exerci The final grade (in pro- where: • M1, M2 – gr • L – grade fro • P – grade fro Students not passing theoretical/numerica final exam, students of the laboratory exer where: • T – grade fro • L – grade fro	rm exam asses a vritten a dterm ex t 50% ir ises. ercentag Grade ade fror om labor om final g the mid l/progra must sc ercise. T G om theo om final	Its and a f nd the s and cons xam lasts n the mid ge) is det e(%) = 0. In question ratory exi- project g dterm exi- ming pro- core at lead the grade Grade(%) retical qui ratory exi- project g	inal exa econd of ists of s 90 m terms a ermined 15(M1+ ns in m ercises iven in ams tak blems a ast 50% on fina = 0.3(T estions ercises iven in	am. The one after and also and also d accord -M2)+0. idterms given in percent e part in and last o, as well l exams )+0.4L+ given in percent	first midterm exam is er the following 6 we oretical/numerical/pro To pass an exam, to have a positive asso ding to the formula: 4L+0,3P, given in percentage, percentage. age. the final exam. It cor s 160 minutes. For p Il as have a positive a s is determined by the 0,3P, n percentage, percentage, age.	sche eeks. ogran he st essm sses form	eduled Each nming tudent ient of ng the sment nula:

	Title	Number of copies in the library	Availability via other media
	I. Marasović – autorizirana predavanja (PowerPoint)		e-learning portal
Required literature (available in the library and via other	M. Ali Mazidi, Sa. Naimi, Se. Naimi, The AVR microcontrollers and embedded systems, Using assembly and C, Prentice Hall, 2011.		·
media)	Ivo Mateljan: Virtualna instrumentacija – skripta, FESB, 2008.		
	A. Šantić: Elektronička instrumentacija, 3. izdanje, Školska knjiga, Zagreb, 1993.		
	Marasović, I: Digitalna instrumentacija I - Upute za laboratorijske vježbe, Skripta za internu upotrebu,		e-learning portal
Optional literature (at the time of submission of study programme proposal)	P. Horowitz, W. Hill: The Art of Electronics, Cambridg M. Balch: Complete digital design: A comprenhensive and computer system architecture, McGRAW-HILL, 2 Timothy S. Margush: SOME ASSEMBLY REQUIRED the AVR Microcontroller, CRC Press, 2012. Günther Gridling, Bettina Weiss: Introduction to Micro & 182.074, Vienna University of Technology Institute Embedded Computing Systems Group, 2007	e University P e guide to digit 2003. D Language Pr ocontrollers, Co of Computer E	ress, 2015. al electronics ogramming with ourses 182.064 Engineering
Quality assurance methods that ensure the acquisition of exit competences	<ul> <li>Record of number of students attending the class</li> <li>Evaluation of results in accordance with expected</li> <li>Feedback from students via student surveys</li> <li>Teachers self-evaluation</li> <li>Institutional and non-institutional evaluations</li> </ul>	ses d learning outc	omes
Other (as the proposer wishes to add)			

NAME OF THE COURSE	ELEMENTS OF ROBOTICS						
Code	FELO29	Year of study	2.				
Course teacher	Mirjana Bonković, Ph.D., Full Professor	Credits (ECTS)	5				
Associate teachers	Miroslav Dujmović, BSc	Type of instruction	L	S	AE	LE	DE
	(external collaborator)	(number of hours)	30	0	0	30	0
Status of the course	Elective	Percentage of application of e-learning	0				
	COURSE	E DESCRIPTION					
Course objectives	<ul> <li>Training students:</li> <li>to understand the basic components (actuators)</li> <li>to understand and to a robotics domain such a to perform desired task</li> </ul>	c working principles and lin s, sensors and control units pply different techniques fr as control and navigation, s	mitation s). or solv as well	ns of ir ing pro as pro	ndividu oblems ogram	ial rob in the ming r	ot obot
Course enrolment requirements and entry competences required for the course	None						
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	Students will be able to: - describe various mech - define a kinematic mod - comment importance c - explain different modes - demonstrate the acquir - demonstrate the function - usefulness and disadvar	anical configurations of rol del of the robot manipulato of dynamics for the robot co s of mobile robot control. red knowledge by program onality of the simulation ar antages of the results	bot ma r (mob ontrol nming t nd be a	nipulat ile rob he rob ble to	tors ot) ot beh comn	avior nent th	e
	Course content					L (	or S ours
	Introduction: history of robo paradigms. Introduction. Hi Robotic paradigms.	otics. Classification of robo istory of robotics. Classific	its. Rol ation o	oot's f robot	s.		2
	Robot components. Degree reference frames. Work sp	es of freedom. Robot coor ace. Robot applications		2			
	Robot kinematics: Robot as a mechanism. A homogeneous transformation matrix. Matrix representation Homogenous transformation matrices. Representations of transformations.						
-	Inverse of transformation m	natrices. Camera coordina	te syst	em.			2
Course content	Forward and inverse kinem	natics of robots.				_	2
detail by weekly	Differential relationships. J	acobian.					2
class schedule (syllabus)	Sensors: sensor characteri types: incremental encoder sensors, vision sensors.	stics, uncertainty represer rs, position and orientation	senso	senso rs, ine	r rtial		4
	Mobile robot kinematics. D control, PID controller, spe	rive. Mobile robot control r ed and position controller.	nodes:	on-off	:		2
	Navigation: planning and c	ontrol.					4
	Visual servoing.						2
	List of laboratory or design	exercises				LE	or DE
	A homogeneous transforms	ation matrix				nc	ours 2
	Forward and inverse kinem	atics of robots.				-	2
	Robot Jacobian.						2
	Mobile robot programming i	in Arduino development er	vironn	nent.			2

	Digital I/O – ultrasonic sensor. Analog inputs – IR sensor. 4									
	Motor control. Conne	ection m	otors and	senso	rs.			4		
	Line following.							2		
	Obstacle avoidance.	ssianma	onte					2		
		SSIGITITE	5111.5.					0		
	$\square$ lectures $\square$ seminars and wor	kehone		🗆 inde	ependen	ent assignments				
Format of instruction	$\Box$ on line in entirety.			⊠ labo	oratory					
	$\Box$ on line in entirety			□ wor	k with m	entor				
	$\Box$ field work				(othe	er)				
Student	The presence on lectures in the amount of at least 70 % of the times sche						s sche	halub		
responsibilities	Performed all require	ed labor	atory exe	rcises.			0 00110			
Screening student	Class attendance	2	Researc	:h		Practical trainir	ng			
proportion of ECTS	Experimental work		Report			Individual work	κ	0,6		
activity so that the	Essay		Seminal essay	•	1	Laboratory exe	ercises	0,8		
ECTS credits is	Tests	0,2	Oral exa	ım		Preparation for laboratory exer	r rcises	0,2		
value of the course)	Written exam	0,2	Project			(Other)				
Grading and evaluating student work in class and at the final exam	<ul> <li>weeks of lectures a presentation and defout in a written formatis the positive assess test and positively e Students are allowed as the final midterm Grade (in percentag Grade(%) = 0,1L + 0 where:</li> <li>L – laborator</li> <li>M1, M2 – mit According to Article teaching activities a exercises. If student in the final exam, and the final exam, and the final exam, and the final exam, and the final exam.</li> </ul>	nd the s fense of at with du sment of evaluate d to have average e) is forn 0,4M1 + ry asses idterm te 65. of f attending does no d will be	second o the proje uration of f laborate d presen e at least e is at lea med acco 0,5M2 sement, est results Faculty's g at leas of meet th e requirec	ne is a ect assig 90 min ory exe tation a 45% of st 50% ording to st 50% ording to st 70% ese crit to enro	fter 13 gnment) utes. Th rcises, s and defe f total po of total of total	weeks of lectur The first midte requirement f 0 % points for ense of the pro- points on midtern points. mula: t is required to ures, and 100 e or he won't be course the nex	res (in rm test or pass the firs ject as n exam particip % of 1 able to ct year.	a form of is carried ing grade t midterm signment. s, as long oate in all aboratory take part		
		Title	•			Number of copies in the library	Availa othe	bility via r media		
Poquired literature	T Siegwart, R., Nour	bakhsh Robots	, I. R., Sc MIT Pro	aramuz ss. 201	zza D., 1		teache	r/Internet		
(available in the library and via other media)	Thomas Braunl, Eml design and application Springer, 2006.	bedded	Robotics	: mobile ed syst		teache	r/Internet			
	S. Thrun, W. Burgar Robotics, MIT Press	d, D. Fo , 2006.	x, Probal	oilistic			teache	r/Internet		
	Saeed B. Niku: Intro Systems, Application	duction	to Roboti tice Hall,	cs: Ana 2001.	alysis,		tea	acher		

	M. Bonković, J. Musić, I Stančić: "Mikroregulatori i ugradbeni mrežni sustavi u Arduino razvojnom okruženju", faculty book, FESB		e-learning portal
	J. Musić, M. Bonković: Authorised lecture notes, FESB		e-learning portal
Optional literature (at the time of submission of study programme proposal)	<ol> <li>Tadej Bajd: Osnove robotike, Fakulteta za elektrote 2000.</li> <li>Kovačić, Laci, Bogdan, Osnove robotike, Fakultet e Zagreb, 1999.</li> </ol>	ehniko, Univer elektrotehnike	za v Ljubljani, i računarstva,
Quality assurance methods that ensure the acquisition of exit competences	<ul> <li>Keeping records of student attendance.</li> <li>Annual analysis of course statistics in terms of</li> <li>Feedback from students via surveys.</li> <li>Teacher self-evaluation.</li> <li>Feedback from graduated students (or senior relevance.</li> <li>Periodic institutional evolution of course teach</li> </ul>	of midterm and r students) on hers.	l finals exams. course content
Other (as the proposer wishes to add)	1		

NAME OF THE COURSE	ENERGY SOURCES							
Code	FENO23	Year of study	1					
Course teacher	Elis Sutlović, Ph.D., Full Professor	Credits (ECTS)	5					
Associate teachers	Marin Mandić, Assistant	Type of instruction (number of hours)	L 30	S 0	AE 0	LE 30	DE 0	
Status of the course	Elective	Percentage of application of e-learning	0				•	
COURSE DESCRIPTION								
Course objectives	<ul> <li>Training students for:</li> <li>acquiring knowledge o converting renewable a</li> <li>acquiring knowledge a into electrical and envir</li> <li>acquiring knowledge a different types of power</li> </ul>	n the characteristics, reser and non-renewable energy bout the processes of con- ronmental impacts, bout the properties and the r plants.	rves ar / sourc verting e opera	nd poss es, variou ating pa	sibilitie Is form arame	s of is of e ters c	energy f	
Course enrolment requirements and entry competences required for the course	None							
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<ul> <li>Students will be able to:</li> <li>classify energy forms,</li> <li>describe the basic featheir exploitation,</li> <li>classify the reserves of</li> <li>analyze the advantage</li> <li>understand conversion power plants and comversion</li> <li>classify different types HPP,</li> <li>describe conversion powersion</li> </ul>	tures of primary forms of e of renewable and non-rene es and disadvantages of c n processes in steam turbi bined-cycle power plants, n processes in nuclear power of hydroelectric power plants orocesses in unconvention	energy ewable ertain ine pov wer pla ants, d al sour	and th energy forms of ver pla ints, escribe ces of	e poss y sourc of ene nts, ga e comp electri	sibility ces, rgy, as turl conen city.	of pine ts of	
	Course content		arsour		electri		L	
	History of Energy Primary	energy Energy conversion	n				2	
	Useful forms of energy Fn	ergy balance Energy bala	ince of	electri	citv		2	
	Coal: types, acquisition, pr	ocessing, environmental in	npact.	reserv	es.		2	
	Liquid and gaseous fuels: acquisition, processing, environmental impact, reserves.							
	Nuclear energy: possibilitie	s, impact on the environm	ent, re	serves			2	
Course content	Steam turbine power plants	<ol> <li>Cogeneration of heat an</li> </ol>	d pow	ər.			2	
broken down in	Gas turbine power plants.	Combined-cycle power pla	ints.				2	
detail by weekly	First midterm exam							
class schedule	Biomass as a Energy Sour	се					2	
(syllabus)	Hydropower. Types of HPF	P. Components of HPP.		-			2	
	Hydropower Turbines. Calo	culation of HPP generation	o capad	city			2	
	Wind energy. Wind power	plants					2	
	Solar energy. Solar therma	il technologies. Photovolta	ic pow	er stati	on.		2	
	Geothermal Electricity Proc	auction. Forms of ocean er	nergy.			$\vdash$	2	
	Second midterm exam							
	List of laboratory or design	exercises					LE nours	
	I ne characteristics and feat	tures of non-renewable en	ergy -1	 >			4	
	ine characteristics and feat	lures of non-renewable en	ergy -2	<u> </u>			4	

	The characteristics a The characteristics a	nd featu nd featu	ires of re ires of re	newabl newabl	e energ e energ	y -1 y -2		4 4
	Comparison of chara	cteristic	s of non-	renewa	ble ene	rgy sources		6
Format of instruction	<ul> <li>☑ lectures</li> <li>☑ seminars and wor</li> <li>□ exercises</li> <li>□ on line in entirety</li> <li>□ partial e-learning</li> <li>□ field work</li> </ul>	<ul> <li>☑ lectures</li> <li>☑ seminars and workshops</li> <li>□ exercises</li> <li>□ on line in entirety</li> <li>□ partial e-learning</li> <li>□ field work</li> <li>□ field work</li> <li>□ independent assignments</li> <li>□ multimedia</li> <li>☑ laboratory</li> <li>□ work with mentor</li> <li>□ (other)</li> </ul>						0
Student responsibilities	The presence on lectures in the amount of at least 70 % of the times sched Performed all required laboratory exercises.						es schedu	led.
Screening student	Class attendance	1	Researc	:h		Practical training		
work (name the proportion of ECTS	Experimental work		Report			Individual work	<	1,8
credits for each activity so that the	Essay		Seminai essay	•	1	Laboratory exe	ercises	1
ECTS credits is	Tests	0,2	Oral exa	ım		Preparation fo laboratory exe	r rcises	
value of the course)	Written exam		Project			(Other)		
Grading and evaluating student work in class and at the final exam	I here are two midte lecturing and the ser of 6 theoretical ques final exams students and final exams are is the positive asses exam or the final exa Grade (in percentag Gr the activities in perce • AL - attenda • LA – laborat • M1, M2 – te The final grade is de <u>Percentage</u> 50% do 61% 62% do 74% 75% do 87% 88% do 100%	rms and cond on stions and s that di carried sment o am. e) is forn ade(%) entage: ince at le ory asse st result termine <u>Desc</u> Good Very Excel	tinal exa e is after ad final to d not pa- out as w f laborato med acco = $0,05$ A ectures, essment, s. d as follo ciption cient (2 (3) Good (4) lent (5)	ims. The ne ests co ss the i ritten te ording to L + 0,15 ws:	e first m xt 6 wee nsist of midterm ests. The ecises an o the for 5LA + 0	andterm exam is eks. Each midte 10 theoretical exams take pa e requirement for d 50 % points mula: ,40 (M1 + M2)	after 7 w erm test o questions art. The n or passing on each r	eeks of consists . In the nidterm g grade nidterm
Required literature		Title	•			copies in the library	Availabi other r	ility via nedia
(available in the	<ol> <li>B. Udovičić. En Građevinska kn</li> </ol>	ergija i i ijiga 198	zvori ene 88.	rgije,		5		
media)	<ol> <li>B. Udovičić. En Građevinska kr</li> </ol>	ergetske ijiga 198	e pretvori 88.	be i bila	nce,	5		
	<ol> <li>E. Sutlović: Pre FESB</li> </ol>	davanja	iz energ	etskih i	zvora,		e-learnin portal	g
Optional literature (at the time of submission of study programme proposal)	- H. Požar: Osr - D. Šljivac, Z. :	nove ene Šimić: C	ergetike, )bnovljivi	svezak izvori e	I, II i III, nergije,	Školska knjiga 2009.	i, Zagreb	1992,

Quality assurance methods that ensure the acquisition of exit competences	<ul> <li>Evaluation of results in accordance with the above learning outcomes</li> <li>Feedback from students via surveys</li> <li>Self-evaluation of teachers</li> <li>Institutional and non-institutional evaluations</li> </ul>
Other (as the proposer wishes to add)	

NAME OF THE COURSE	ENGLISH LANGUAGE 1							
Code	FEOO02	Year of s	tudy	1				
Course teacher	Mira Braović Plavša senior lecturer	Credits (E	ECTS)	2				
Associate teachers	-	Type of ir (number	nstruction of hours)	L	S 30	AE	LE	DE
Status of the course	Mandatory	Percenta applicatio	ge of on of e-learning	0				
	COURSE	E DESCRI	PTION					
Course objectives	raining students for: understanding and application of technical vocabulary concerning electrical engineering and information technology development of students' oral and written communication skills in English improving general English language knowledge							
Course enrolment requirements and entry competences required for the course	None							
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<ul> <li>Students will be able to:</li> <li>Explain basic notions of electrical charge and c</li> <li>Define and explain the transistors</li> <li>Correctly read numbers used in engineering</li> <li>Translate independent tables, diagrams and c</li> <li>Use relevant grammar effect clauses, irregula</li> <li>Use phrasal expression</li> </ul>	of electrica onductivity term elect s, units, ec ly less con harts structures r plurals, M ns to impro	I engineering, el ronics and expla quations and oth nplicated profess (passive, reduc /ILU-s) ove English lang	ectricit ain use er mat sional t ed rela uage k	y, elec of ser hemati exts a ative cla	troma nicono ical ex nd inte auses dge	gnetisi ductors pressi erpret , cause	m, s and ons e and
	Course content					S nours	/ hc	\E ours
	Introduction to the course, U1 - Electricity Study section 1 – introduction to characteristics of technical							
	LI 2 – Electromagnetism					2		
	Study section 2 – general a	and techni	cal English			2		
Course content	U 3 – Electric charges, elec	ctrical con	ductivity			2		
broken down in detail by weekly	Study section 3 – multiword	d lexical u	nits			2		
class schedule	U 4 - Mathematics					2		
(syllabus)	First midterm exam							
(0)	U 5 – Electronics					2		
	Study section 5 – passive v	/OICE				2		
	U 6 – Semiconductors	alativa ala				2		
	Sludy Section 6 –reduced r	elative cla	uses			2		
	Study section 7- both eithe	er neither				2		
	Second midterm exam					_		
	□ lectures		⊠ independent	assigr	ments			
	Seminars and workshop	S	□ multimedia	5				
Format of instruction			□ laboratorv					
	□ on line in entiretv		□ work with me	entor				
□ partial e-learning □ (other)								

	□ field work							
Student responsibilities	The presence on lect Performed all require	tures in ed exerc	the amou cises.	unt of at leas	st 70	) % of the time	s schedu	led.
Screening student	Class attendance		Researc	h	I	Practical traini	ng	
proportion of ECTS	Experimental work		Report		I	Individual work	ζ.	1
activity so that the total number of	Essay		Seminar essay			(Other)		
ECTS credits is	Tests	1	Oral exa	im		(Other)		
value of the course)	Written exam		Project		(Other)			
Grading and evaluating student work in class and at the final exam	There are two midter lecturing and the se both midterm exams both midterm exams 50 % of the test she according to the sco 15 % of best solved 35 % of second best 35 % next solved te 15 % of lowest pass	erms and a final exam. The first midterm exam is after 7 wee econd one is after the next 6 weeks. Students who do not is have to take the final exam containing learning materials s. nould be solved to have a passing grade. The grade is fo ore: d tests - excellent (5) st solved test - very good (4) ests - good (3) sing tests- sufficient (2). the final test in the third term can get only sufficient grade ( xams are carried out according to the academic year calend					eeks of ot pass als from formed	
	Midterm and final ex	ams are	test in the carried of	e third term	can g to	get only suffic the academic	ient grade year cale	e (2). endar.
	Midterm and final ex	ams are	test in the carried o	e third term	can g to	get only suffic the academic Number of copies in the library	ient grade year cale Availabi other r	e (2). endar. ility via nedia
Required literature (available in the library and via other	1. Štambuk, An Electrical Eng FESB.	Title uška (20 gineerin	carried of carried of 005). Eng g and Co	lish in puting. Sp	can g to lit:	get only suffic the academic Number of copies in the library	ient grade year cale Availabi other r	e (2). endar. Ility via nedia
Required literature (available in the library and via other media)	1. Štambuk, An Electrical Eng FESB. 2. Glendinning, Oxford Englis Oxford:OUP	Title Title uška (20 gineerin Eric H.; sh for In	test in the carried of 005). Eng g and Co John Mc formation	lish in mputing. Sp Ewan (2006 Technology	lit:	get only suffic the academic Number of copies in the library	ient grade year cale Availabi other r	e (2). endar. ility via nedia
Required literature (available in the library and via other media) Optional literature (at the time of submission of study programme proposal)	<ol> <li>Štambuk, An Electrical Eng FESB.</li> <li>Glendinning, Oxford Englis Oxford:OUP</li> <li>Glendinng, Eric H.; O Mechanical Enginee</li> <li>Master, Peter (2004)</li> <li>Department of State</li> <li>Mc Carthy, Michael; Cambridge: Cambrid</li> </ol>	Title uška (20 gineerin Eric H.; sh for In Glendinr Glendinr ring. Ox ). Englis , Office O'Dell, dge Univ	2005). Eng g and Co John Mc formation hing, Norr ford: Oxfe h Gramm of English Felicity. (i versity Pre	e third term o but accordin llish in mputing. Sp Ewan (2006 Technology man (2001). ord Universi nar and Tech n Language 2008). Acad ess.	lit: ). (Oxf Proj emi	get only suffic the academic Number of copies in the library ford English for ress. al Writing. Was grams. c Vocabulary i	ient grade year cale Availabi other r	e (2). endar. ility via nedia
Required literature (available in the library and via other media) Optional literature (at the time of submission of study programme proposal) Quality assurance methods that ensure the acquisition of exit competences	<ol> <li>Štambuk, An Electrical Eng FESB.</li> <li>Glendinning, Oxford Englis Oxford:OUP</li> <li>Glendinng, Eric H.; O Mechanical Enginee</li> <li>Master, Peter (2004) Department of State</li> <li>Mc Carthy, Michael; Cambridge: Cambrid</li> <li>Evaluation of results</li> <li>Feedback from stude</li> <li>Self-evaluation of te</li> </ol>	Title uška (20 gineerin Eric H.; sh for In Glendinr Glendinr ring. Ox ). Englis , Office O'Dell, dge Univ s in acco ents via eachers	test in the carried of 2005). Eng g and Co John Mc formation hing, Norr ford: Oxfe h Gramm of English Felicity. (2 versity Pre rdance w surveys	e third term o but accordin llish in mputing. Sp Ewan (2006 Technology man (2001). ord Universi nar and Tech h Language 2008). Acad ess.	lit: ). / Oxff Prop emii	get only suffic the academic Number of copies in the library	<ul> <li>ient grade year cale</li> <li>Availabi other r</li> <li>Electrica</li> <li>shington:</li> <li>n Use.</li> </ul>	e (2). endar. ility via nedia

NAME OF THE COURSE	ENGLISH LANGUA	GE 2												
Code	FEOO03		Year of st	udy		1								
Course teacher	Mira Braović Plavša senior lecturer		Credits (E	ECTS)		3								
Associate teachers	-		Type of ir (number o	nstruction of hours	on S)	L	S 30	AE	LE	DE				
Status of the course	Mandatory		Percentag applicatio	ge of n of e-le	earning	0	0							
	CO	URSE	DESCRI	PTION										
Course objectives	Training students for: - understanding and engineering and infor - development of stud - improving general E	d appl mation dents' d inglish	ication o technolo oral and w language	f techn gy vritten c knowle	ical vo ommuni edge	cabular ication s	y con skills in	cernin Engli	g ele sh	ctrical				
Course enrolment requirements and entry competences required for the course	None	lone												
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<ul> <li>Students will be able</li> <li>Explain basic not</li> <li>Define and explain</li> <li>Explain and desc</li> <li>Explain the function</li> <li>Translate independing rams and chate</li> <li>Use relevant grame affect clauses, irr</li> </ul>	Students will be able to: Explain basic notions of computer science Define and explain the structure of the computer and its performances Explain and describe types of communications and their role in everyday life Explain the function of internet technology Translate independently less complicated professional texts and interpret tables, diagrams and charts Use relevant grammar structures (passive, reduced relative clauses, cause and effect clauses, irregular plurals, MLU-s)												
	Course content	_					H	S nours	/ hc	AE ours				
	U 9 – Computer tech	nology						2						
	Study section 9 – adj	ective	compariso	on stien				2						
	Study costion 10	ard for	and lund	uffixee				2						
Course content	LL 13 - Telecommunic	oru ion	nation. St	liixes				2						
broken down in	Study section 13 – m	odal ve	rhs					2						
detail by weekly	Study section 14 – m	odal ve	erbs cont					2						
class schedule	First midterm exam	000.00						-						
(syllabus)	Unit 20 Electric Powe	er Syste	em					2						
	Study section 20 – Di	iscours	e marker	s				2						
	Unit 21 Transformers	;						2						
	Study section 21 – As	s, wher	n and whi	le				2						
	Unit 22 Generators							2						
	Study section 22 – Pa	ast Par	ticiple					2						
	Second midterm exar	m												
Format of instruction	<ul> <li>□ lectures</li> <li>□ seminars and work</li> <li>□ exercises</li> <li>□ on line in entirety</li> <li>□ partial e-learning</li> <li>□ field work</li> </ul>	<ul> <li>□ lectures</li> <li>□ seminars and workshops</li> <li>□ exercises</li> <li>□ on line in entirety</li> <li>□ partial e-learning</li> <li>□ field work</li> </ul>												
Student responsibilities	The presence on lect Performed all require	ures in d exer	the amou cises.	unt of a	t least 7	0 % of 1	the tim	es scł	nedule	ed.				
	Class attendance		Researc	h		Practic	al train	ing						

work (name the	Experimental work		Report		Individual worl	k	1	
proportion of ECTS credits for each	Essay		Seminar essay		Presentations			
activity so that the	Tests	2	Oral exam		(Other)			
ECTS credits is equal to the ECTS value of the course)	Written exam		Project		(Other)			
Grading and evaluating student work in class and at the final exam	During the semester students are to hold a presentation from their field of profess The presentation is evaluated according to the structure and content, delive nonverbal communication and visuals and takes 20% points of the overall ere grade. There are two midterms and a final exam. The first midterm exam is after 7 weel lecturing and the second one is after the next 6 weeks. Each midterm exam to 40% of the overall exam grade. Students who do not pass both midterm exams to to take the final exam containing learning materials from both midterm exams. 50 % of the test should be solved to have a passing grade. The grade is for according to the achieved results from the presentation and the following tests so 15 % of best solved tests - excellent (5) 35 % of second best solved test - very good (4) 35 % next solved tests - good (3) 15 % of lowest passing tests- sufficient (2). Students who pass the final test in the third term can get only sufficient grade (2 Midterm and final exams are carried out according to the academic year calend							
	Midterm and final ex	ams are	e carried out acc	erm car ording to	n get only suffic o the academic	ient grade year cale	e (2). endar.	
Required literature	Midterm and final ex	ams are	e carried out acc	erm car ording to	the academic Number of copies in the library	vear cale Availabi other r	e (2). endar. ility via nedia	
Required literature (available in the library and via other	Midterm and final ex Štambuk, Anuška (2	Title	a carried out acc	ording to	n get only suffic the academic Number of copies in the library	vear cale Availabi	e (2). endar. ility via nedia	
Required literature (available in the library and via other media)	Štambuk, Anuška (2 Engineering and Cor Glendinning, Eric H.	Title 2005). Ei mputing	a carried out acc anglish in Electric Split: FESB. Accevan (2006),	erm car ording to al Oxford	n get only suffic the academic Number of copies in the library	vear cale Availabi other r	e (2). endar. ility via nedia	
Required literature (available in the library and via other media)	Štambuk, Anuška (2 Engineering and Co Glendinning, Eric H. English for Informati	Title 2005). Er mputing ; John M on Tech	a carried out acc carried out acc splish in Electric Split: FESB. IcEwan (2006). inology. Oxford:	al Oxford OUP	Number of copies in the library	Availabi	e (2). endar. ility via nedia	
Required literature (available in the library and via other media) Optional literature (at the time of submission of study programme proposal)	Štambuk, Anuška (2 Engineering and Co Glendinning, Eric H. English for Informati Glendinng, Eric H.; ( Mechanical Enginee Master, Peter (2004) Department of State Mc Carthy, Michael; Cambridge: Cambrid	Title 2005). Er mputing ; John M on Tech Glendinr ering. Ox ). Englis , Office O'Dell, dge Univ	A carried out acc a carried out	al Oxford OUP O01). Ox iversity I Technic uage Pro	A get only suffice the academic Number of copies in the library ford English fo Press. cal Writing. Wat ograms.	r Electrica shington:	e (2). endar. ility via media al and US	
Required literature (available in the library and via other media) Optional literature (at the time of submission of study programme proposal) Quality assurance methods that ensure the acquisition of exit competences	Štambuk, Anuška (2         Engineering and Cord         Glendinning, Eric H.         English for Informati         Glendinng, Eric H.; G         Mechanical Engineer         Master, Peter (2004)         Department of State         Mc Carthy, Michael;         Cambridge: Cambridge: Cambridge: Cambridge         Evaluation of results         Feedback from stude         Self-evaluation of teat	Title 2005). En mputing ; John M on Tech Glendinr ering. Ox ). Englis c, Office O'Dell, dge Univ dge Univ s in acco ents via achers	A carried out acc a carried out	al Oxford OUP D01). Ox iversity l Technic Jage Pro Academ	A get only suffice the academic Number of copies in the library Aford English fo Press. Cal Writing. Wat ograms. Anic Vocabulary in earning outcom	Availabi other r r Electrica shington: in Use.	e (2). endar. ility via nedia	

NAME OF THE COURSE	FUNDAMENTALS OF EL	ECTRICAL ENGINEERIN	G 1						
Code	FENO01	Year of study	1.						
Course teacher	Tomislav Kilić, Ph.D., Full Professor	Credits (ECTS)	7						
Associate teachers	Nedjeljka Grulović- Plavljanić, M.Sc., Senior	Type of instruction (number of hours)	L	S	AE	LE	DE		
Status of the course	Lectuter Obligatory	Percentage of	45 0	0	30	15	0		
		application of e-learning							
		DESCRIPTION							
Course objectives	<ul> <li>understanding and app engineering,</li> <li>setting up and solving</li> <li>permanent adoption ar engineering.</li> </ul>	plication of basic principles simple electrical circuits, ad deepening of knowledge	and late	ws of a	electrio of elec	cal trical			
Course enrolment requirements and entry competences required for the course	one								
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<ul> <li>Students will be able to:</li> <li>define the fundamental engineering,</li> <li>apply fundamental laws electromagnetic quanti</li> <li>apply methods and tec</li> <li>formulate simple electric</li> <li>analyse simple electric</li> <li>calculate quantities of s</li> <li>measure basic electric</li> </ul>	<ul> <li>Students will be able to:</li> <li>define the fundamental phenomena, the quantities and the laws of electrical engineering,</li> <li>apply fundamental laws of electrical engineering for the calculation of electromagnetic quantities,</li> <li>apply methods and techniques for solving of linear electrical networks,</li> <li>formulate simple electrical networks,</li> <li>analyse simple electrical networks,</li> <li>calculate quantities of simple magnetic circuits,</li> </ul>							
	Course content				L hours	/ hc	AE ours		
	Introduction to Electrical Er	ngineering. Brief history of	electric	al	3		2		
	engineering. SI units. Char Fundamentals of Electric C Electrical resistance. Ohm' U characteristics.	ge and physical property c Fircuits. Sources of Electric s Law. Circuit elements ar	of matte aty. ad their	er. I-	3		2		
	Temperature dependence Laws. Series Resistors and Resistors and the Current	of electrical resistance. Kir I the Voltage Divider Rule. Divider Rule.	chhoff': Paralle	s əl	3		2		
Course content broken down in	Wye–Delta Transformation Circuit analysis techniques	. Voltage and Current sou	rces.		3		2		
detail by weekly class schedule	Method of loop currents. Pr Equivalent Circuits. Millman	rinciple of superposition. T	hévenii	n's	3		2		
(syllabus)	Power and energy of DC cl transfer.	urrent. Joule's law. Maxim	um pov	ver	3		2		
	Electrostatics. Coulomb's la	aw. Electric field. Gauss's	law.		3		2		
	First midterm exam				3		2		
	Electrostatic potential. Electroment. Electrical polarisa	ctrical influence. Electric di ition.	pole		3		2		
	Dielectric in electrical field.	Capacitors.			3		2		
	Electrostatic energy. Capa	citor switching on DC powe	er supp	ly.	3		2		
	Electromagnetism. Magnet Magnetic field and electric between magnets. Ferroma	ic field. Magnetic field line currents. Magnetic flux. Fo agnetic materials.	s. orce		3		2		

	Faraday's Law. Self	araday's Law. Self inductance and mutual inductance. 3 2								
	Magnetic circuits. Inc	agnetic circuits. Inductor switching on DC power supply.								
	Magnetic energy.		5		2					
	Second midterm exa	am					3		2	
	List of laboratory exe	ercises						L	E hours	
	Current and Voltage	Measur	ements						2	
	Mixed resistor circuits	S							2	
	Electrical resistance	neasur		rnositio	n				2	
	Thévenin's and Millm	an's the	orem	rpositio	11			2		
	Capacitor and induct	or switc	hina on E	)C powe	er suppl	V			2	
	Practical skills exam			e pone		<i>J</i>			3	
	⊠ lectures									
	□ seminars and wor	t assignme	nts							
	⊠ exercises									
Format of instruction	$\Box$ on line in entirety	$\Box$ on line in entirety								
	□ partial e-learning			⊔ work	with m	entor				
	☐ field work				(othe	er)				
Student	The presence on lec	tures in	the amo	unt of at	least 7	0% of the t	imes s	chedu	iled	
responsibilities	Performed all require	ed labor	atory exe	ercises.				onout		
Screening student	Class attendance	2,5	Researc	h		Practical tr	aining			
proportion of ECTS	Experimental work		Report			Individual v	vork		3,2	
credits for each activity so that the	Essay		Seminal essay	r		Laboratory exercises			0,5	
ECTS credits is	Tests	0,2	Oral exa	am		Preparation for aboratory exercises			0,5	
value of the course)	Written exam	0,1	Project			(Other)				
Grading and evaluating student work in class and at the final exam	There are two midte lecturing and the set of 10 theoretical que theoretical questions not pass the midtern as written tests. The laboratory exercises (in percentage) is for Gr the activities in perce • NP - attenda • LV – laborat • M1, M2 – test	rms and cond on estions s and nu n exams e require and 40 rmed ac rade(%) entage: ance at l ory asse st result	I final example is after and nun umerical s take part ement fo % points cording t = 0,05 N lectures, essment, s.	ams. The the nex- nerical p problem rt. The n r passin on each o the for P + 0,15	e first m t 6 wee problem ns. In th nidterm g grade midterr rmula: 5 LV + (	idterm exan eks. Each n is and final e final exan and final ex e is the pos m exam or t 0,4 (M1 + M	n is aft hidterm tests o ns stuc kams a sitive as he final 2)	er 7 w test o consis dents re car ssess exam	veeks of consists st of 20 that did rried out ment of h. Grade	
Doguirod literatura		Title	9			copies i the libra	n Av n o ry	ailab ther	ility via media	
(available in the	T. Kilić: Autorizirana	predava	anja, FES	SВ				e-lea poi	rning rtal	
media)	V. Pinter: Osnove el Zagreb, 1987	ektroteh	nike, Teł	nnička k	njiga,	5				
	E. Šehović, i drugi: (	Osnove	elektrotel	hnike zh	oirka					
	primjera (prvi dio), Š	kolska l	knjiga, Za	greb, 19	992.	5				
Optional literature (at the time of submission of study	B. Jajac: Teorijske o B. Jajac: Teorijske o	snove e snove e	elektroteh elektroteh	nike, sv nike, sv	ezak 1, ezak 2,	Graphis, Z Graphis, Z	agreb, agreb, 2	1998. 2002.		

programme proposal)	
Quality assurance methods that ensure the acquisition of exit competences	<ul> <li>Evaluation of results in accordance with the above learning outcomes</li> <li>Feedback from students via surveys</li> <li>Self-evaluation of teachers</li> <li>Institutional and non-institutional evaluations</li> </ul>
Other (as the proposer wishes to add)	

NAME OF THE COURSE	FUNDAMENTALS OF EL	ECTRICAL ENGINEERIN	G 2										
Code	FENO28	Year of study 1.											
Course teacher	Silvestar Šesnić, Ph.D., Assistant Professor	Credits (ECTS)	6				-						
Associate teachers	-	Type of instruction (number of hours)	L 30	S 0	AE 30	LE 15	DE 0						
Status of the course	Obligatory	Percentage of application of e-learning	0										
	COURSE	E DESCRIPTION											
Course objectives	<ul> <li>understanding the fundamentals of time dependant quantities in electrical engineering;</li> <li>solving simple AC circuits;</li> <li>lifelong learning in the field of electrical engineering.</li> </ul>												
Course enrolment requirements and entry competences required for the course	None	one											
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<ol> <li>Students will be able to:</li> <li>define basic param</li> <li>describe current-vo</li> <li>apply vector and si</li> <li>calculate basic par</li> <li>explain mutual indu</li> <li>measure fundament</li> </ol>	<ol> <li>tudents will be able to:</li> <li>define basic parameters of time dependant quantities;</li> <li>describe current-voltage characteristics in AC circuits;</li> <li>apply vector and symbolic methods for solving AC circuits;</li> <li>calculate basic parameters of simple three-phase systems;</li> <li>explain mutual inductance in AC circuits;</li> <li>measure fundamental AC electrical quantities</li> </ol>											
	Course content			l	or S	/ hc	∖E ours						
	Time dependant quantities sinusoidal currents.	. Periodical, alternating an	d		2		2						
	Fundamental effects of alte mean-square value. Basic	ernating current. Mean valu principles of AC generator	ue. Roo	ot-	2		2						
	Current-voltage characteris	stics in AC circuits.			2		2						
	Alternating current power a	and energy.			2		2						
	Mathematical fundamentals sinusoidal quantities.	s of vector representation	of		2		2						
Course content	Complex AC circuits.				2		2						
broken down in detail by weekly	Application of complex calc voltages.	culus to alternating current	s and		2		2						
(svllabus)	Analysis of AC circuits via	complex calculus.			2		2						
(0)	Complex power. Maximum	power theorem.			2		2						
	Resonance in AC circuits.				2		2						
	Symmetrical and asymmet connection.	rical three-phase systems	. Wye		2		2						
	Delta connection. Power in	Delta connection. Power in three-phase systems. 2 2											
	Mutual inductance. Coil wit	h an iron core.			2		2						
	List of laboratory or design	exercises				LE o	or DE ours						
	Active and inductive (capac	itive) series AC circuit					2						
	Active and inductive (capac	itive) paralel AC circuit					2						

	AC power							2			
	Serial (voltage) resor	nance						2			
	Three-phase system	s – wye	connecti	on				2			
	Three-phase system	s – delta	a connect	ion				2			
	Single-phase transfo	rmer op	en circuit	test				2			
Format of instruction	<ul> <li>☑ lectures</li> <li>□ seminars and wor</li> <li>☑ exercises</li> <li>□ on line in entirety</li> </ul>	independent assignments independent assignme									
	<ul> <li>□ partial e-learning</li> <li>□ field work</li> </ul>	field work									
Student responsibilities	Attending at least 70	tending at least 70% of lectures and 100% of laboratory exercises.									
Screening student work (name the	Class attendance	lass attendance 2 Research Practical training									
proportion of ECTS credits for each	Experimental work		Report			Laboratory exe	ercises	1			
activity so that the	Essay		Seminar essay			Individual work	K	2.8			
ECTS credits is	Tests	0.1	Oral exa	ım		(Other)					
value of the course)	Written exam	Vritten exam 0.1 Project									
Grading and evaluating student work in class and at the final exam	after 13 weeks of led (two in summer and on the parts they did the final exam is a p passing an exam is Final grade is establ - students that have best 15% – excellen following 35% – very following 35% – goo last 15% – satisfacto - students that have	ctures). one in a ositive g at least ished as passed t (5); / good ( d (3); passed	After the autumn te be during the grade from 50% of pois 50% of pois 50% of pois 50% of pois 50% of pois 50% of pois 600	lectures, rm). Dui ne midte n labora oints on idterm e	, three f ring the frm tests tory exe each m exams a	inal tests will b final tests, stu- s. The requiren ercises. The re- idterm (part of nd summer fin <u>n – satisfactor</u>	e condu dents ta nent for quireme the fina al exam	Icted Ike exam taking ent for Il exam). Is;			
		Title	•			Number of copies in the library	Availa othe	bility via <sup>r</sup> media			
Required literature	Pinter V · Osnove e	lektrotel	hnike Kn	iida druc	na	the library					
library and via other	Tehnička knjiga, Zag	greb, 19	87.	jiga alag	yu,	1					
media)	Felja, I., Koračin, D.: primjera iz osnova e knjiga, Zagreb	Zbirka lektrotel	zadataka hnike, I i I	i riješer II dio, Šk	nih kolska	6					
Optional literature (at the time of submission of study programme proposal)	Pinter V.: "Osnove e	inter V.: "Osnove elektrotehnike - knjiga prva", Tehnička knjiga, Zagreb, 1987									
Quality assurance methods that ensure the acquisition of exit competences	<ul> <li>record of att</li> <li>analysis of p</li> <li>student surv</li> <li>head of chains</li> </ul>	endance bassing rey; ir evalua	e; percenta; ation.	ges;							
Other (as the proposer wishes to add)											

NAME OF THE COURSE	HIGH-FREQUENCY ELECTRONICS											
Code	FELO41	`	Year of s	tudy		3.						
Course teacher	Ivan Marinović, Ph.D Professor	). Full	Credits (E	ECTS)		4						
Associate teachers		-	Type of ir (number	nstruction of hours	n )	L 30	S	AE	LE 15	DE		
			Percenta	ae of		00			10			
Status of the course	Elective	i	applicatio	on of e-le	arning							
	00	DURSE	DESCRI	PTION								
Course objectives	Training students for - analysis of simpl - doing measurem	: le RF ar nents or	nd MW ci n the circu	rcuits uits								
Course enrolment requirements and entry competences required for the course	Finished course Elec	ctronic c	circuits									
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	Students will be able - understand princ - do DC analysis c - do AC analysis c - make measurem	udents will be able to: understand principles of basic RF and MW circuits do DC analysis of the circuits do AC analysis of the circuits make measurements of the basic RF and MW parameters										
	Course content	course content										
	Impedance matching	n filters						4		ouis		
	Modulators, oscillato	ors, frequ	uency sy	nthesize	rs			6				
	C-class power ampli	fiers	<u> </u>					3				
Course content	Transmission line, w	aveguid	les					6				
broken down in	Smith chart							2				
detail by weekly	S-matrices, passive	structur	es T diada		diada			5	-			
class schedule (syllabus)	List of laboratory or o	design e	exercises	GUNN	lioue			4	LE	or DE		
	LP and HP filters									3		
	Oscillator									3		
	C-class power amplif	ier								3		
	Slotted line									3		
	Directional coupler									3		
Format of instruction	<ul> <li>☑ lectures</li> <li>☑ seminars and wor</li> <li>☑ exercises</li> <li>☑ on line in entirety</li> <li>☑ partial e-learning</li> <li>☑ field work</li> </ul>	<ul> <li>☑ lectures</li> <li>□ independent assignments</li> <li>□ multimedia</li> <li>☑ laboratory</li> <li>□ partial e-learning</li> <li>□ field work</li> <li>□ (other)</li> </ul>										
Student	The presence on lec	tures ar	nd exercis	ses in th	e amou	int of at	least	t 70% o	f the	times		
responsibilities	scheduled. Performe	ed all ree	quired lat	poratory	exercis	es.						
Screening student work (name the	Class attendance	1	Researc	h		Practic	al tra	ining				
proportion of ECTS	Experimental work		Report			Exercis	ses			1		
credits for each activity so that the	Essay		Seminai essay	r		Individu	ual w	ork		2		

total number of ECTS credits is	Tests		Oral exam		(Other)					
equal to the ECTS value of the course)	Written exam		Project		(Other)					
Grading and evaluating student work in class and at the final exam	There are two midte lecturing and the se theoretical questions exams students that carried out as writte grading is applied.	ere are two midterms and final exams. The first midterm exam is after 7 weeks of uring and the second one is after next 6 weeks. Each midterm test consists of pretical questions and numerical problems as well as the final test. In the final ms students that did not pass the midterm exams take part. The midterms ar ried out as written tests while the final exams are written and oral. The absolut ding is applied.								
		Title	)		Number of copies in the library	Availabi other r	lity via nedia			
Required literature (available in the	I. Modlic, B. Modlic, elektronika, modulao frekvencije, Školska	odlic, B. Modlic, Visokofrekvencijska tronika, modulacija, modulatori, sintezatori 5 /encije, Školska knjiga								
media)	I. Modlic, B. Modlic, elektronika, oscilator knjiga	Visokof ri, pojač	rekvencijska ala snage, Škols	ka	5					
	I. Zanchi, Z. Blaževio Split	ć, Mikro	valna elektronika	a, FESB		e-lear por	ning tal			
Optional literature (at the time of submission of study programme proposal)	-									
Quality assurance methods that ensure the acquisition of exit competences	<ul> <li>Evidence of stud</li> <li>Annual analysis</li> <li>Teachers self-evidents</li> <li>Students feedbal</li> </ul>	Evidence of students attendance Annual analysis of grades achieved Teachers self-evaluation Students feedback via questionnaires and surveys								
Other (as the proposer wishes to add)										

NAME OF THE COURSE	HIGH VOLTAGE ENGINEERING									
Code	FENO19	Year of st	udy	3						
Course teacher	Petar Sarajčev, Ph.D., Associate Professor	Credits (E	ECTS)	5						
		Type of i	nstruction	L	S	AE	LE	DE		
Associate teachers		(number	of hours)	30		15	15			
Status of the course	Obligatory	Percenta applicatio	ge of n of e-learning	0						
	COURSE	DESCRI	PTION							
Course objectives	<ul> <li>Training students for:</li> <li>understanding basic in</li> <li>carrying out analysis (a</li> <li>designing overvolatge switchyards</li> <li>understanding metal-ox</li> <li>carrying out insulation</li> </ul>	sulating pr analytical a protection xide surge coordinatio	operties of mate and numerical) c of high voltage arrester selection procedure	erials of powe transfo on proc	r syste rmer s cedure	em ove stations	ervolta s and	ges		
Course enrolment requirements and entry competences required for the course	None	ne udents will be able to:								
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	Students will be able to: understand layout and functioning of the high voltage testing facility explain the procedure for testing high voltage apparatus apply methods for power system overvoltage analysis select metal-oxide surge arresters for specific applications carry out insulation coordination procedure									
	Course content					L or S hours	h	AE ours		
	Gaseous, liquid and solid i	nsulating i	materials			3		1		
	Townsed theory, Paschen	law				2		1		
	Natural and artificial polluti	ion of exte	rnal insulation			2		1		
	High voltage testing labora	atory				3		1		
	Marx generator. Generatin for proving nominal insulat	g impulse ion level	test voltages. N	lethods	;	2		1		
broken down in	Temporary, switching and and numerical analysis of	lightning o power sys	vervoltages. Ana tem overvoltage	alytical s		6		5		
class schedule	Travelling waves. Bewley's	s lattice				3		1		
(syllabus)	Backflashover, shielding fa	ailure, TLA	S			2		1		
	Metal-oxide surge arrester	S				3		1		
	Insulation coordination					4		2		
	List of laboratory or design	exercises					LE (	or DE ours		
	Analysis of switching overvo	oltages usi	ing Matlab/Simu	link				5		
	Analysis of switching overvo	oltages usi	ing EMTP-ATP					4		
	Metal-oxide surge arresters	in power :	system transien	t analy	sis nor etc	tion		3		
	Insulation coordination of hi	gn vollage	air-insulated tra	ansion	ner sta	alion		3		
Format of instruction	<ul> <li>seminars and workshop</li> <li>exercises</li> <li>on line in entirety</li> <li>partial e-learning</li> <li>field work</li> </ul>	S	<ul> <li>□ independent</li> <li>□ multimedia</li> <li>□ laboratory</li> <li>□ work with model</li> <li>□ (otheligned)</li> </ul>	t assigr entor r)	nments	3				

Student responsibilities											
Screening student work <i>(name the</i>	Class attendance	1,5	Research		Practical training						
proportion of ECTS	Experimental work		Report		Individual wor	2,5					
activity so that the total number of	Essay		Seminar essay		Laboratory excercises		0,5				
ECTS credits is	Tests	0,5	Oral exam		(Other)						
value of the course)	Written exam		Project		(Other)						
Grading and evaluating student work in class and at the final exam	lecturing and the sec 10 theoretical questions not pass the midtern as written tests. The laboratory exercises (in percentage) is for the activities in perce	The are two midterms and final exams. The first midterm exam is after 7 weeks of uring and the second one is after the next 6 weeks. Each midterm test consists of theoretical questions and numerical problems and final tests consist of 10 pretical questions and numerical problems. In the final exams students that did pass the midterm exams take part. The midterm and final exams are carried out written tests. The requirement for passing grade is the positive assessment of pratory exercises and 50% points on each midterm exam or the final exam. Grade percentage) is formed according to the formula: Grade(%) = 0,5 (M1 + M2) activities in percentage: M1, M2 – test results.									
Required literature (available in the library and via other		Title	9		Number of copies in the library	Availabi other r	ility via nedia				
media)	P. Sarajčev, A	utorizira	na predavanja, F	ESB		e-learnin	g portal				
Optional literature (at the time of submission of study programme proposal)	<ul> <li>E. Kuffel, W.S. Z</li> <li>Second edition,</li> <li>J. A. Martinez-Vendetermination, C</li> </ul>	Zaengl, C Elsevier elasco ( CRC Pre	J. Kuffel, High vol r, Oxford, 2008. Ed.), Power syste ss, Boca Raton,	ltage er em tran: 2010.	ngineering: Fun sients: Parame	damental ter	S,				
Quality assurance methods that ensure the acquisition of exit competences	<ul> <li>Evaluation of res</li> <li>Feedback from s</li> <li>Self-evaluation of</li> <li>Institutional and</li> </ul>	Evaluation of results in accordance with the above learning outcomes Feedback from students via surveys Self-evaluation of teachers Institutional and non-institutional evaluations									
Other (as the proposer wishes to add)											

NAME OF THE COURSE	HUMAN EXPOSURE TO	ELECTROMAGNETIC RA	DIATIO	N						
Code	FELO32	Year of study	3.							
Course teacher	Vicko Dorić, Ph.D., Associate Professor	Credits (ECTS)	5							
Associate teachers	Anna Šušnjara	Type of instruction (number of hours)	L S AE LE DE 30 0 0 30							
Status of the course	Elective	Percentage of application of e-learning	0							
	COURSE	E DESCRIPTION	•							
Course objectives	<ul> <li>Training students for:</li> <li>understanding and application of basic principles of electromagnetic and thermal dosimetry,</li> <li>assessment of human exposure to a sources of both high frequency and low frequency electromagnetic fields,</li> <li>accepting knowledge from the area of the bio electromagnetics,</li> <li>using national and international legislation for the assessment of human exposure to EM radiation</li> </ul>									
Course enrolment requirements and entry competences required for the course	None.	one.								
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<ul> <li>define the fundamental</li> <li>measure external EM f</li> <li>calculate external EM f</li> <li>analyze levels of huma international legislation</li> <li>calculate basic parame models,</li> <li>use commercial softwa the realistic human boo</li> </ul>	<ul> <li>Students will be able to:</li> <li>define the fundamental terms in bio electromagnetics,</li> <li>measure external EM fields both on high and low frequencies,</li> <li>calculate external EM fields both on high and low frequencies</li> <li>analyze levels of human exposure to EM radiation according to national and international legislation,</li> <li>calculate basic parameters of the internal dosimetry using simple human body models,</li> <li>use commercial software packages for the internal dosimetry analysis based on</li> </ul>								
	Course content			L	or S	4	λE			
	Electromagnetic pollution	lonizing and non-ionizing r	adiatio		2	nc	ours			
	EM field coupling to humar fields. High and low freque statistical studies.	n body. Biological effects o ncy effects. Epidemiologic	f the El al and	M	2		0			
	Basic parameters of electro density, induced electric fie external fields, power dens	omagnetic dosimetry: curre eld, specific absorption rate ity.	ent e (SAR)	,	2		0			
Course content broken down in detail by weekly	Electromagnetic radiation p international legislation. Ba levels.	protection guidelines. Nations is a construction sand reference of the second sec	onal and nce	d	2		0			
class schedule (syllabus)	Methods for the theoretical Incident and internal field d	and experimental dosime losimetry.	try.		2		0			
(0))	Characterization of the rad measurement of the low fre the power lines and transfo	iation sources. Calculation equency electric field. Expo ormer stations.	and osure to	D	2		0			
	Calculation and measurem Exposure to the RFID ante stations.	ent of the high frequency l nnas, mobile phones and	EM fielo base	l.	2		0			
	Classification of the interna anatomical models of the h	al dosimetry models. Simpl numan body.	lified an	d	2		0			
	Electromagnetic modeling frequencies (LF). Whole bo	of the human body at low ody exposure to the LF fiel	ds.		2		0			

	Electromagnetic modeling of the human body at high frequencies (HF). Human eye and brain exposure to the 2							0
	Human exposure to	the tran	sient field	ds.			2	0
	Thermal response of fields. Thermal response to the plane wave	f the hui onse of	man body the huma	y expose an eye a	ed to the nd brain	e HF n exposed	2	0
	Biomedical application the nerves. Laser tree methods. Transcran	ons of E eatment	M fields. of the ey	Electric e. Brain	al stimu stimula	ulation of ation	2	0
	List of laboratory or	design e	exercises	diation	(1110)			LE or DE hours
	Simulation models fo (frequencies up to 10	r the hu ) MHz)	man exp	osure to	nonion	iizing EM ra	diation	4
	Simulation models fo (frequencies above 1	or the hu 0 MHz)	man exp	osure to	nonion	izing EM ra	diation	4
	Measurement setup to EM fields.	and met	hods for	the asse	essmen	t of human	exposure	6
	LF electric fields mea	electric fields measurement.						
	LF magnetic fields m	magnetic fields measurement.						
	EM field calculation in	n vicinity	y of the b	ase stat	ion.			4
Format of instruction	<ul> <li>☑ lectures</li> <li>□ seminars and workshops</li> <li>☑ exercises</li> <li>□ on line in entirety</li> <li>□ partial e-learning</li> <li>□ field work</li> </ul>							
Student responsibilities	The presence on lect Performed all require	tures in ed labor	the amo atory exe	unt of at ercises.	t least 7	0 % of the t	imes sche	eduled.
Screening student work (name the	Class attendance	2,0	Researc	h		Practical tra	Practical training	
proportion of ECTS	Experimental work		Report			Individual w	vork	2,0
credits for each activity so that the	Essay		Semina essay	r		Laboratory exercises		0,5
ECTS credits is	Tests	0,2	Oral exa	am		Preparation for laboratory exercises		0,2
value of the course)	Written exam	0,1	Project			(Oth	ner)	
Grading and evaluating student work in class and at the final exam	There are two midterms and final exams. The first midterm exam is after 7 weeks of lecturing and the second one is after the next 6 weeks. In the final exams students take tests they didn't pass on the midterm exams. Both midterm tests last for the 75 min. and consists of 10 questions or problems. In order to pass the exam, students are required to finish all laboratory exercises and gain at least 50% of total points at both midterm exams. Final score is determined in following way: Score(%) = 0,5 (M1 + M2) where M1 and M2 are midterm exams score. Final grade is determined according the final score: Score Grade							
	50% to 62%         Suffi           63% to 75%         good           76% to 88%         very           89% to 100%         excel	cient (2) d (3) good (4 ellent (5)	) 4)					

	In the final exams students take tests they didn't pass is performed in the written form. It lasts for the 75 min or problems. In order to pass the exam, students are total points. The final grade is then determined as exp	s on the midte n. and consists required to gai plained above	rm exams. Exam s of 10 questions n at least 50% of
Required literature	Title	Number of copies in the library	Availability via other media
library and via other media)	D.Poljak, Teorija elektromagnetskih polja s primjenama u inženjerstvu, Šk. knjiga Zagreb, 2014.	5	
media)	D. Poljak: Izloženost ljudi elektromagnetskom zračenju, Kigen, Zagreb, 2007.	5	
Optional literature (at the time of submission of study programme proposal)	<ol> <li>D. Poljak, Advanced Modeling in Cocompatibility, Wiley Interscience, New York 2</li> <li>D. Poljak: Human Exposure to Electron Southampton- Boston, 2003</li> <li>R.W.Y. Habash, Electromagnetic Fields at 2002.</li> <li>D. Poljak: Exposure of Humans to Electro Library 2002.</li> </ol>	omputational 2007. nagnetic Fiel nd Radiation, magnetic Rac	Electromagnetic ds, WIT Press, Marcel Dekker, liation, SoftCOM
Quality assurance methods that ensure the acquisition of exit competences	<ul> <li>Evaluation of results in accordance with the a</li> <li>Feedback from students via surveys</li> <li>Self-evaluation of teachers</li> <li>Institutional and non-institutional evaluations</li> </ul>	above learning	outcomes
Other (as the proposer wishes to add)			

NAME OF THE COU	NAME OF THE COURSE HYDRAULIC AND PNEUMATIC SYSTEMS								
Code	FETO	01	Year of study	3					
Course teacher	Jani B Full Pr	arle, Ph.D., ofessor	Credits (ECTS)	4					
			Type of instruction	L	S	AE	LE	CE	
Associate teachers	Alen K	(ovač	(number of hours)	30	0	0	15	0	
Status of the course	Electiv	/e	Percentage of application of e-learning	0				•	
			COURSE DESCRIPTION						
Course objectives	Course objectives To develop ability to identify hydraulic or pneumatic system elements by symbol and function and to use that skills for fault finding and solving.								
Course enrolment requirements and entry competences required for the course	None								
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	Stude 1. Pre pn 2. Ide 3. Cor 4. Crit sy 5. Det	<ol> <li>Present general concepts associated with industrial application of hydraulics and pneumatics.</li> <li>Identify components of the system and draw related symbols.</li> <li>Combine various elements with respect to size and design concept.</li> <li>Critically assess workability and supportability of complex hydraulic and pneumatic systems.</li> <li>Determine faults and failure causes.</li> </ol>							
	Cours	e content				h	L	LE	
	Introduction to pneumatics. Basic physical principles of 2								
	Standards and Symbols. Compressed air generation and distribution.								
	Typica	al pneumatic s	ystems demonstrations.					1	
	Basic elements of pneumatic systems (check, pressure control and directional control valves).								
	Metho	ods for develop	oment of pneumatic systems	S.				2	
	Basic elements of pneumatic systems (directional control valves, valve actuation types).								
Course content	Basic	elements of p	neumatic systems (cylinders	s and mo	otors).		2		
broken down in	Circui	t assembling o	on pneumatic didactic table.					2	
detail by weekly	Valve	combinations.	Electropneumatic systems				2		
class schedule (syllabus)	Introd Funda cavita	uction to hydra amental hydrau tion	aulics. Basic physical princip ulic problems: cleanness, te	oles of h mperatu	ydraulics ire,	5.	2		
	Typica	al hvdraulic sv	stems demonstrations.					1	
	Hydra	ulic elements	for energy conversion: cvlin	ders, pu	mps and	t l	2		
	motor	s with constan	t and adjustable displaceme	ent.	•		2		
	Basic and p	control eleme	nts in hydraulics: check valv ressure-relief valves.	es, dire	ct acting		2		
	Hydra	ulic elements	and their most important pa	rts.				2	
	Basic	control eleme	s in hydraulics: direct acting and pilot						
	opera contro	ted directional	control valves, pressure rec	gulators,	, flow		2		
	Hydra cylind	ulic cylinders	- parallel and series circuit. and load.	Synchro	nizing			2	

	Typical design solutions of hydraulic elements for energy conversion (cylinders, pumps and motors with constant and adjustable displacement).2						2		
	Typical hydrau braking, counte	lic circuits er balance	s: accumulato e. Hydraulic p	r holding,   resses.	pum	p unloading,		2	
	Pressure contr	ol circuits	. Flow and sp	eed contro	ol cir	cuits.	2		
	Piloted and ele	ctrically c	ontrolled hyd	raulic syste	ems.		2		
	Examples: actu speed control v	uator spee with flow r	ed adjustmen egulators.	ts with thro	ottle	valve vs.		1	
Format of instruction	<ul> <li>☑ lectures</li> <li>□ seminars an</li> <li>☑ exercises</li> <li>□ on line in ent</li> <li>□ partial e-lear</li> <li>□ field work</li> </ul>	d worksho tirety ming	ops	⊠ individ ⊠ multim ⊠ labora □ work v □ individ	individual assignments multimedia laboratory work with mentor individual project (other)				
Student	Minimum of 70	inimum of 70 percent lecture attendance. Completing all the required laboratory							
responsibilities	exercises.								
Screening student work (name the	attendance	1,5	Research			Practical traini	ing		
proportion of ECTS credits for each	Experimental work		Report			Individual work			
activity so that the total number of	Essay	ssay essay				Preparation for exercises			
ECTS credits is equal to the ECTS	Tests	Tests 0,2 Oral exam				(Other)			
value of the course)	Written exam	Written exam Project (Other)							
Grading and evaluating student work in class and at the final exam	There are two r classes and the written tests, m The oral exam passing grade exam. The final score • midterm 1 • midterm 2 • oral exam • class atten Score 50% - 62% 63% - 76% 77% - 88% 89% - 100%	There are two midterms and final exams. The first midterm exam is after 7-week session classes and the second one is after the next 6 weeks. The midterms are carried out as written tests, made up of three questions relating to the basic issues and schematics. The oral exam is focused on the student's interpretation skills. The requirement for passing grade is the positive assessment on each midterm exam (>49%) or the final exam. The final score is: $Score (\%) = 0,35' A_1 + 0,35' A_2 + 0,20' A_3 + 0,10' A_4$ • midterm 1: $A_1 = 50 - 100 \%$ , • midterm 2 (seminal paper): $A_2 = 50 - 100 \%$ , • oral exam: $A_3 = 50 - 100 \%$ . • class attendance: $A_4 = 70 - 100 \%$ . Score Grade 50% - 62% sufficient (2) 63% - 76% good (3) 77% - 88% very good (4)							
Required literature		Titl	e		C	Number of opies in the library	Availabi other r	ility via nedia	
(available in the library and via other media)	Barle, J.: Hydra handbook and <i>Hidraulika i pne</i>	Barle, J.: Hydraulics and pneumatics, (student handbook and workbook in Croatian: <i>Hidraulika i pneumatika</i> ), FESB, Split, 2010.					e-learning	) portal	
	Nikolić, G.: Pne Zagreb, 1994.	umatika,	Skolske novi	ne,					
Optional literature (at the time of submission of study	Koroman, V.; M Lang, R.A. (ed Systems, Man	Zagreb, 1994. Koroman, V.; Mirković, R.: Hidraulika i pneumatika, Školska knjiga, Zagreb, 1991. Lang, R.A. (ed.): Hydraulic Trainer 1; Planning and Design of Hydraulic Power Systems, Mannesmann Rexroth AG, 1998.							

programme proposal)	Rabie, M.: Fluid Power Engineering, McGraw-Hill, 2009.
Quality assurance methods that ensure the acquisition of exit competences	<ul> <li>Evaluation of results in accordance with the above learning outcomes</li> <li>Feedback from students via surveys</li> <li>Self-evaluation of teachers</li> <li>Institutional and non-institutional evaluations</li> </ul>
Other (as the proposer wishes to add)	

NAME OF THE COURSE	INSTRUMENTATION FOR SMART GRID								
Code	FENO31	Year of study	3.						
Course teacher	Goran Petrović, Ph.D., Associate Professor	Credits (ECTS)	5						
Associate teachers	Juraj Alojzije Bosnić, assistant	Type of instruction (number of hours)	L 30	S 0	AE 0	LE 30	DE 0		
Status of the course	Elective	Percentage of application of e-learning	50						
	COURSE	E DESCRIPTION							
Course objectives	Training students for: - using Dynamic Signal - using Power Quality in - creating simple virtual	Analyser struments instruments.							
Course enrolment requirements and entry competences required for the course	None	None							
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	Students will be able to: - use multimeter and dig - use Dynamic Signal Ar - use PQ meter with har - understand syncrophas - create virtual instrumer - describe basic properti	use multimeter and digital oscilloscope use Dynamic Signal Analyzer use PQ meter with harmonics and flicker understand syncrophasor and their applications create virtual instrument in Labview. describe basic properties of IEC 61850 protocol							
Course content					L hours	A ho	\E ours		
	Inductive and electronic vo transformers.		2		0				
	Analog transducers of pow	er system quantities.			2		0		
	Principles of Sigma Delta a digital converters.		2		0				
	Mathematical algorithms for current, active and reactive		2		0				
	Mathematical algorithms for spectrum. Total Harmonic	nt,	2		0				
	Phasor measurement tech applications.	niques. Synchrophasors a	nd their		2		0		
Course content	Extensible Markup Langua	ge and IEC 61850 protoco	ol.		2		0		
detail by weekly	First midterm exam								
class schedule (svllabus)	Introduction to LabVIEW en LabVIEW application for ac	nvironment. Data types. Si cquire analyze and present	mple t data.		2		0		
(-)	Using Loops and Decision- Vectors, Arrays, Matrices.	Making Structures. Shift re	egisters	-	2		0		
	Modular programming in La and signal processing with	abVIEW. Acquiring Measu ELVIS and cDAQ Hardwa	rements re.	5	2		0		
	Implementing File I/O funct Automatic report generatio	tions to read and write data n.	a to files	5.	2		0		
	Embedded Control and Mo I-O Through the FPGA	nitoring Using LabVIEW.	Accessi	ng	2		0		
	Interfacing between the FP Finite sampling using for lo	GA and Real-Time Proces	ssor.		2		0		
	Second midterm exam								
List of laboratory exercises						LE	nours		
	Transient measurements with digital oscilloscope HP 54501A         3								

	Network analysis with	n Digital	Signal A	nalyzer	HP 356	55A		3	
	Using PQ meter ION	Ising PQ meter ION 7650							
	Distant measuremen	t with A	LFA via e	thernet				3	
	Introduction to LabVI	EW env	vironment	. Data t	ypes. Us	sing Loops,		3	
	Structures. Shift registers. Vecto	rs, Arra	ys, Matric	es. Mo	dular pro	ogramming in		3	
	LabVIEW.			<u> </u>					
	Connection instrume	nts into	Labview.	Creatin	ng netwo	ork publish varia	ables.	3	
	Practical skills evan	eration.						2	
								2	
		kebone		🗆 inde	pendent	assignments			
		Kanopa		⊠ mult	timedia				
Format of instruction	$\square$ on line in entirety	on line in entirety							
				□ wor	k with me	entor			
	$\Box$ field work				(othe	r)			
Student		ned work							
responsibilities	Performed all require	ed labor	atory exe	ercises.			5 5010		
Screening student	Class attendance	1	Researc	:h		Practical traini	ng		
proportion of ECTS	Experimental work		Report	eport Ir		Individual work	(	2	
activity so that the	Essay		Seminar L		Laboratory exercise		0,5		
total number of ECTS credits is equal to the ECTS	Tests	0,5	0,5 Oral exam		Preparation for laboratory exercises		0,5		
value of the course)	Written exam	0,5	Project			(Other)			
Grading and evaluating student work in class and at the final exam	There are one midte midterms exam is a and consists of 5 th exam is evaluated a Grade (in percentage the activities in perce • M1, M2 – te	rms exa fter labo leoretica s knowi e) is for entage: st result	Ims that is pratory ex al questic ng Labvie med acco Grade(%	s carried kercises ons and ew prog ording to b) = 0,5	d out, aft s. First n numeric raming la o the forr (M1 + N	er 7 weeks of le nidterms exam cal problems. anguage. mula: 12)	ecturin ⊢is writ Secono	g. Second tten exam d midterm	
	,					Number of	A ! ! .	-  -       (	
Required literature (available in the library and via other		Title	9			copies in the library	othe	er media	
media)	G. Petrović: Skripta	s preda	vanja, FE	SB			e-le P	earning oortal	
Optional literature (at the time of submission of study	Alan S. Morris: Signa 2006. A.G. Phadke, J.S. Tl	al Proce horp Sy	essing of	Power ( ed Phas	Quality D	Disturbances, If	EEE Pr Their	ess.	
programme proposal)	Applications, Springe LabVIEW Basics I In	er, 2008 troducti	3. Ion Cours	e Manu	ual				
Quality assurance	- Evaluation of res	sults in a	accordan	ce with	the abov	e learning out	comes		
methods that ensure	- Feedback from s	students	s via surv	eys					
the acquisition of	- Self-evaluation of	of teach	ers						
exit competences	- Institutional and	non-ins	titutional	<u>evaluat</u>	ions				
Other (as the proposer wishes to add)									

NAME OF THE COURSE	INTERNET PROGRAMMING								
Code	FELO35	Year of study	3						
Course teacher	Ljiljana Šerić, Ph.D., Assistant Professor	Credits (ECTS)	4						
Associate teachers	Marin Bugarić, Ph.D., Senior Research Assistant Andrija Sommer, mag ing	Type of instruction (number of hours)	L 30	S 0	AE 0	LE 15	DE 0		
Status of the course	Obligatory	Percentage of application of e-learning	30						
	COURSE	DESCRIPTION							
Course objectives	Training students for: - Understanding the - Preparation and pr Web - Designing, editing - Write simple script	operating principles of the ocessing of data and infor and maintenance of the co s for dynamic web content	e Interne mation ontent p	et for pu bublish	blicati ed on	on on the w	the eb		
Course enrolment requirements and entry competences required for the course	Completed courses: Programming 1 Programming 2	Completed courses: Programming 1 Programming 2							
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<ol> <li>Students will be able to:         <ol> <li>Appoint communication protocols used on the Internet</li> <li>Describe the steps of the TCP / IP protocol</li> <li>Identify elements of HTML code</li> <li>Design and write HTML code of Web sites consisting of several web pages</li> <li>Write an external CSS document with instructions for the design of the sites</li> <li>Write simple JavaScript code that dynamically modifies website</li> <li>Explain the difference between client and server scripting technology</li> </ol> </li> </ol>								
	Course content			L	or S	/ hc	\E ours		
	Introduction. History of the protocols	Internet. Internet Commun	nication		6				
	HTML language for web pa	age development. HTML5			4				
	CSS style language. CSS3				4				
	XML, XHTML				2				
					4				
					2				
Course content	PHP				2				
broken down in detail by weekly	Overview of other tehnolog	ijes for web page program	ming		2				
class schedule (syllabus)	List of laboratory or design	exercises				LE (	or DE ours		
Introduction. History of the Internet. Internet Communication pro					ols		2		
	HIML language for web page development. HTML5 2						2		
	CSS style language. CSS3 2						2		
	AIVIL, ATTIVIL 1						1		
							∠ 2		
	njaz iQuerry						∠ 2		
	PHP						2		
	Overview of other tehnologi	jes for web page program	ming						
	5					1			

Format of instruction	☑ lectures       ☑ independend         ☑ seminars and workshops       ☑ multimedia         ☑ exercises       □ laboratory         ☑ on line in entirety       □ work with         □ partial e-learning       □ (other states of the					nt assignments nentor er)		
Student responsibilities	The presence on lect Performed all require	tures in ed labor	the amore the amore the the the the the the the the the th	unt of a crcises.	t least 7	0 % of the time	es schedu	led.
Screening student	Class attendance	1	Researc	:h		Practical traini	ng	
work (name the proportion of ECTS	Experimental work		Report			Individual work (Other)	K	1
credits for each activity so that the	Essay		Seminar essay	•	1	Laboratory exe (Other)	ercises	0,5
total number of ECTS credits is equal to the ECTS	Tests		Oral exa	IM		Preparation for laboratory exe (Other)	r rcises	0,5
value of the course)	Written exam		Project		(Other)			
Grading and evaluating student work in class and at the final exam	During the semester be held after 7 week are written on a com At the final exam stu- the mid-term exams At the final exam ar The requirement for 60% of points achiev The number of poin exams, or the number The final grade is de Percentage Rating 60% to 69% is suffic 70% to 79% good (3 80% to 89% very go 90% 100% Excellent	held after 7 weeks of classes, the second after the next 6 weeks. Mid-term exams written on a computer and consists of 20 random questions to be answered. the final exam students can take only parts of material that they did not 140ystem mid-term exams the final exam ar autmn students take the whole subject matter of the course. e requirement for passing grade is positively evaluated seminar paper and at least % of points achieved on the mid-term / final exam. e number of points is calculated as the arithmetic average of the two mid-term ams, or the number of points the entire final exam. e final grade is determined as follows: rrcentage Rating % to 69% is sufficient (2) % to 79% good (3) % to 89% very good (4) % 100% Excellent (5)						
Required literature		Title	•			Number of copies in the library	Availabi other r	lity via nedia
(available in the	Lj.Šerić, Programira	nje za Ir	nternet, p	redavaı	nj,		e-lear	ning tal
media)	M.Bugarić, upute za		e-lear	ning tal				
	http://www.w3schoo	ls.com					we	b
Optional literature (at the time of submission of study programme proposal)	D. Sušanj, D. Petric: L. Abrus ,"Irada web Comer, D.E.: The In Zeid, I.: Mastering th Deitel, Deitel ✓ Neto	D. Sušanj, D. Petric: "Velika knjiga o Worl Wide Webu", Znak, Zagreb 1996. g. L. Abrus ,"Irada weba, abeceda za Webmastere",BUG ✓ SysPrint, Zagreb,2003 Comer, D.E.: The Internet Book, Prentice Hall, 2000. Zeid, I.: Mastering the Internet ✓ HTML, Prentice Hall, 2000. Deitel Deitel ✓ Neto, Internet ✓ WWW – How to Program, Prentice Hall, 2000.						
Quality assurance methods that ensure the acquisition of exit competences	<ul> <li>Keeping records</li> <li>Annual review of</li> <li>Student survey if</li> <li>Self-evaluation of</li> <li>Feedback from secourse content</li> </ul>	of the cl f the perf n order to of teache students	ass attenc ormance c o evaluate rs who have	lance of exam teacher already	s graduate	ed from about the	erelevance	of the
Other (as the proposer wishes to add)								

NAME OF THE COURSE	INTRODUCTION TO COMPUTER APPLICATIONS								
Code	FESY01	Year of study	1.						
Course teacher	Goran Petrović, Ph.D., Associate Professor	Credits (ECTS)	5						
Associate teachers	Josip Vasilj, PhD.	Type of instruction (number of hours)	L 30	S 0	AE 0	LE 30	DE 0		
Status of the course	Obligatory	Percentage of application of e-learning	0				1		
	COURSE	E DESCRIPTION							
Course objectives	Training students for: - using internet, e-learni - using computers as off - using computers as en	ng, and protection from ma fice tool igineer's tool	alicious	softw	are.				
Course enrolment requirements and entry competences required for the course	None	lone							
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<ul> <li>Students will be able to:</li> <li>Identify and discuss the</li> <li>Identify and discuss matrix</li> <li>Describe the operating</li> <li>Use office application f</li> <li>Use office application f</li> <li>Identify and discuss so</li> </ul>	Identify and discuss the main functions of computer: IO, processing, storage. Identify and discuss main hardware parts of personal computer. Describe the operating system functions and some OS services. Use office application for word processing, Use office application for spreadsheet and presentation, Identify and discuss some engineer's tools.							
	Course content				L hours	/ hc	\E ours		
	History of computers. Com		2		0				
	Representing information a Instructions. Machine langu		2		0				
	The History of Operating S Components of an Operati		2		0				
	Network fundamentals. Ne World Wide Web. Malicious	he	2		0				
	Office tools: Word process Formatting. Printing.	ing. MS Word environmen	t. Editir	ng.	2		0		
Course content broken down in	Office tools: Symbols. Table Equations. Figures. Drawing	ulators. Tables. Inserting c ngs. Headers and footers.	bject.		2		0		
detail by weekly class schedule	Office tools: Styles. Templa Circular letters. Table of co	ates. Spell check. Bookma ontent.	ırks.		2		0		
(syllabus)	First midterm exam								
	Office tools: Spreadsheets Formatting. Printing.	. MS Excel environment. E	diting.		2		0		
	Office tools: Sorting and fill functions. Graphs. Pivot ta	tering. Forms. References ble.	and		2		0		
	Office tools: Presentations. Smart Art. MS Visio enviro		2		0				
	Engineers tools: Introduction types. Simple LabVIEW ap present data. Using Loops	on to LabVIEW environme plication for acquire analy and Decision-Making Stru	nt. Data ze and ictures.	a	2		0		
	Engineers tools: Shift regis Modular programming in La functions. Automatic report	sters. Vectors, Arrays, Mati abVIEW. Implementing File generation.	rices. e I/O		2		0		

	Hardware: Processor. Random Access Memory Mass storage: Magnetic systems, Optical systems, Flash drives. Buses. IO channels. Monitors. Scanners. Printers.2								0
	Second midterm exa	Im							
	List of laboratory exe	ercises						LE	hours
	Internet: www, E-mai	I. E- lea	rning. Wi	ndows e	explorei rinting	r. Accessori	es.	_	3
	MS Word: Symbols. Figures Drawings H	Tabulate Paders	ors. Table and foote	etup. r es. Insei	rting obj	ject. Equatio	ons.		3
	MS Word: Styles. Te	mplates	. Spell ch	ieck. Bo	okmark	s. Circular	letters.		0
	Table of content.		•						3
	MS Excel: Environme	Excel: Environment. Editing. Formatting. Printing. 3							
	MS Excel: Sorting an Graphs Pivot table	phs. Pivot table							3
	MS Power Point: Env	vironme	nt. Smart	Art. MS	S Visio e	environment	t.		3
	Introduction to LabVI	EW env	rironment	. Data t	ypes. U	sing Loops,	,		2
	Structures. Automation	c report	generatio	on.					3
	Practical skills exam								2
	⊠ lectures			□ inde	penden	t assignme	nts		
	□ seminars and wor	kshops		⊠ mult	imedia	t deelge			
Format of instruction	⊠ exercises			⊠ labo	ratory				
	□ <i>on line</i> in entirety		□ work with me			entor			
	□ partial e-learning		□ (other			er)			
Student responsibilities	The presence on lectures in the amount of at least 70 % of the times scheduled. Performed all required laboratory exercises.								
Screening student	Class attendance	1	Researc	:h		Practical tra	aining		
proportion of ECTS	Experimental work		Report		Individual v	work		3	
activity so that the	Essay		Semina essay	•		Laboratory	exercise	s	0,5
total number of ECTS credits is	Tests	0,5	Oral exam			Preparation for laboratory exercises		5	0,5
value of the course)	Written exam	0,5	Project			(Other)			
Grading and evaluating student work in class and at the final exam	There are two midterms and final exams that are carried out as written tests. The first midterm exam is after 7 weeks of lecturing and the second one is after the next 6 weeks. Each midterm test consists of 30 short theoretical questions and final tests consist of 30 short theoretical questions. In the final exams students that did not pass the midterm exams take part. The requirement for passing grade is the positive assessment of laboratory exercises and 40 % points on each midterm exam or the final exam. Grade (in percentage) is formed according to the formula: Grade(%) = 0,4 LV + 0,3 (M1 + M2) the activities in percentage: LV – laboratory assessment,								
Required literature (available in the library and via other		Title	9			Number copies i the libra	of Ava n otl	ilabi ner n	lity via nedia
media)	G. Petrović: Skripta	s predav	vanja, FE	SB			e	lear port	ning :al
Optional literature (at the time of submission of study	J. Glenn Brookshear A. Mamishev. M. Sa Microsoft Word, Micr LabVIEW Basics I In	: Comp rgent, C osoft P troducti	uter scier creating F ress, 201 on Cours	nce an c Researcl 3. e Manu	overviev h and S al	v, Addison-V	Wesley.	2012 Usin	g

programme proposal)										
Quality assurance methods that ensure the acquisition of exit competences	<ul> <li>Evaluation of results in accordance with the above learning outcomes</li> <li>Feedback from students via surveys</li> <li>Self-evaluation of teachers</li> <li>Institutional and non-institutional evaluations</li> </ul>									
Other (as the proposer wishes to add)										
NAME OF THE COURSE	INTRODUCTION TO ENTREPRENEURSHIP									
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Code	FESY03	Year of study	2.							
Course teacher	Marija Šiško Kuliš, Ph.D., Associate Professor	Credits (ECTS)	3	3						
		Type of instruction	L	S	AE	LE	DE			
Associate teachers		(number of hours)	30		15					
Status of the course		Percentage of application of e-learning								
COURSE DESCRIPTION										
Course objectives	ives Students introduce into the entrepreneurship world which is the process of creating value where the businessman at the one place collects all the resources needed for the realization of business opportunities by acapting the risk of losing money, time or some form goods or service. All students who can submit the challenges of decision-making can learn how to become an entrepreneur and how to to behave entrepreneurially									
Course enrolment requirements and entry competences required for the course	No.	۱٥.								
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<ol> <li>Students will be able to:</li> <li>To define corectly the terms entrepreneur and entrepreneurship through the thought, content and conceptual basis.</li> <li>To assess and analyze the entrepreneurial activity in the context of economic and engineering dimensions.</li> <li>The strengths and weaknesses accession to the entrepreneurship.</li> <li>To collect and interpret data in the field of market analysis (competition, distributors, partners) and make conclusions regarding issues of entrepreneurial activity.</li> <li>To understand the basic elements of the entrepreneurial accounting and analysis of financial reports.</li> <li>To develop a business plan in the field of engineering entrepreneurship with all necessary, technological, economic and financial parameters.</li> <li>To present their own business plan clearly and unequivocally that will</li> </ol>									
	Course content					/ hc	λE			
	1. Introduction – The con	cept of enterprise and			2		1			
	entrepreneurship				2		1			
	2. Business idea, brainsto	orming and focus groups			2		1			
	A Business Plan Part 1				2		1			
Course content	5 Marketing				2		1			
broken down in	6 Market Analysis				2		1			
detail by weekly	7. Fixed and current asse	ets			2		1			
class schedule	8 Amortization 2 1									
(syllabus)	9. Cost benefit analysis				2		1			
	10. Entrepreneurial infrast	ructure			2		1			
	11. Entrepreneurial incuba	tors			2		1			
	12. The kinds of entrepren	eurship			2		1			
	13. Company establishme	v establishment					1			
	4. Franchise 2						1			
	15. Practice examples and	I presentation of business	plans		2		1			

	List of laboratory or	List of laboratory or design exercises								
Format of instruction	<ul> <li>☑ lectures</li> <li>☑ seminars and workshops</li> <li>☑ exercises</li> <li>□ on line in entirety</li> <li>□ partial e-learning</li> <li>□ field work</li> <li>□ independent</li> <li>□ multimedia</li> <li>□ aboratory</li> <li>□ work with me</li> <li>□ (other</li> </ul>				t assignments nentor er)					
Student responsibilities										
Screening student	Class attendance	nce 0.5 Research I				Practical traini	ng			
proportion of ECTS	Experimental work		Report			(Other)				
activity so that the	Essay		Semina essay	-		(Other)				
ECTS credits is	Tests	1	Oral exam 0.5		(Other)					
equal to the ECTS value of the course)	Written exam		Project		1	(Other)				
Grading and evaluating student work in class and at the final exam	During the semester exam after 7 weeks exam students take Each midterm carrie of 20 odd questions independently write. evaluation of the self formed according to Rating (%) = 0.05 + where activities are • NP – attendance a • PP – Feedback fro • M1, M2 – POINTS The final grade is de ECTS grading syste System, University of into four sub-groups very good, the next 3 sufficient. Students v exam in autumn perf exam graded the over and lasts 90 minutes	During the semester there will be two mid-term exams (tests). The first is the pre- exam after 7 weeks of classes, the second after the next 6 weeks. On the final exam students take the parts of the material that did not pass on the mid-term. Each midterm carried out as written exam for a period of 75 minutes and consists of 20 odd questions and is based on the business plan which students independently write. The requirement for a positive evaluation is a positive evaluation of the self-made business plan, and the final grade (in percentages) formed according to the formula: Rating (%) = 0.05 + 0.15 NA 0.4 PP + (M1 + M2) where activities are expressed in percentages: • NP – attendance at lectures, • PP – Feedback from the business plan, • M1, M2 – POINTS midterm. The final grade is determined after the second final exam, applying the relative ECTS grading system in accordance with the Regulations on Study and Study System, University of Split. A group of students who passed the exam is divided into four sub-groups: 15% of the best students are graded excellent, 35% following very good, the next 35% are graded good and the last 15% of the assessment is sufficient. Students who did not pass the exam after two final exam take a makeup exam in autumn period in which they can get a positive grade. At the Correctional exam graded the overall material. The exam is written with 20 questions and tasks								
		Title	9			copies in the library	Availa othe	bility via r media		
	M. Šiško Kuliš: Auto	rizirana	predavar	nja, FES	SB		<u>https:/</u> g.fest	<u>/elearnin</u> b.unist.hr		
Required literature (available in the	M. Šiško Kuliš: Auto	rizirana	radna bil	ježnica			<u>https:/</u> g.fesb	/elearnin .unist.hr		
library and via other media)	Kirby, D., A.: Entrep London, 2003.	rby, D., A.: Entrepreneurship, McGraw Hill, ondon, 2003.			0	https:// azon.c epren Da Kirby/c	/www.am :o.uk/Entr ieurship- avid- dp/00770 8587			

	Kolaković, M.: Poduzetništvo u ekonomiji znanja, Sinergija, Zagreb, 2006.	0	http://www.supe rknjizara.hr/?pa ge=knjiga&id_k njiga=17388					
Optional literature (at the time of submission of study programme proposal)	<ul> <li>Longenecker, J. G.; Moore, C. W.: Small Busines Entrepreneurial Emphasis, Thomson South-Wes</li> </ul>	Longenecker, J. G.; Moore, C. W.: Small Business Management – An Entrepreneurial Emphasis, Thomson South-Western, 2003						
Quality assurance methods that ensure the acquisition of exit competences	<ul> <li>registering the class attendance</li> <li>annual analysis of the performance of the examination</li> <li>student survey in order to evaluate teachers</li> <li>self-evaluation of teachers</li> <li>feedback from students who have already graduated the relevance of content course</li> </ul>							
Other (as the proposer wishes to add)								

NAME OF THE COURSE	INTRODUCTION TO PROGRAMMING									
Code	FELO02	Year of study	1							
Course teacher	Ljiljana Šerić, Ph.D., Assistant Professor	Credits (ECTS)	5							
Associate teachers	Marin Bugarić, Ph.D., Senior Research	Type of instruction (number of hours)	L 30	S 0	AE 0	LE 30	DE 0			
Status of the course	Obligatory	Percentage of application of e-learning	30							
	COURSE	E DESCRIPTION								
Course objectives Training students for: Understanding the performance of computer Understanding the programming code To write simple computer programs										
Course enrolment requirements and entry competences required for the course	None									
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<ol> <li>List the basic parts of the computer model</li> <li>Identify the basic parts of the programming code</li> <li>Describe the principles of storing basic data types in computer memory</li> <li>Enumerate and explain the working principle of commands for program flow control</li> <li>Write a computer program structured in a several user-defined classes stored in multiple files</li> <li>Write a computer program – Applet with a graphical user interface</li> </ol>									
	Course content		_ or S hours	/ hc	AE ours					
	Introduction. Components	and computer operation. A	s you r	un	2					
	Approachesof different pro characteristics of the progra program in the Java progra execution of the programa differences between Java a	d s	2							
	The integer and decimal n Integer and decimal math. class	r	2							
Course content broken down in	Character data. Using the s String class, operators	String class. The methods	of the		2					
class schedule	statements, branching and	looping			2					
(syllabus)	The functions and procedu parameter passing by value functions.	res. The arguments, parar e and references. Recursiv	neters, ve		2					
	Complex data types. Array	s. Storing an Array in the	memor	у.	2					
	Objects and classes. An excode in multiple files. Computing the files.	canple of a simple class. V pile and run the program w	Vriting vritten in	n	2					
	Programs with a graphical simple applet. Colors and p	user interface. Applet. Exa painting geometric figures.	amples	of	2					
	Communication with the pr the data within the applet.	ogram user. Printing and r	eading		2					
	vvorking with files. Classes	Vorking with files. Classes for working with files. 2								

	The advanced 148ystem san148 the definition of class. Static variables and methods. More about variables and methods.2Final variables and constants.2						2		
	Events. Exceptions a	and flow	/S				2	_	
	List of laboratory or o	design e	exercises						E or DE hours
	Installation and setup	of Java	a and Ecl	ipse pro m in .lav	grammi /a	ng environr	nent.		2
	Formatted printing	ig the m	ot progra		/u.				2
	Integer variables and	integer	math						2
	Decimal variables an	d decim	al math						2
	Strings (data retrieva	I from th	ne keyboa	ard (Con	soleRe	ader))			2
	Single, double and m	Single, double and multiple branching commands, software loop							2
	Graphic applet								2
	Class object	Class object							2
	Objects and classes,	separat	tion of co	de in mi	ultiple fi	les			2
	Command-Line Argu	Command-Line Arguments							2
	VVORKING with Files	Working with Files						_	2
		seu exe	ercises						2
				⊠ inde	pendent	t assignmer	nts		
	□ seminars and wor	kshops		D multi	media	•			
Format of instruction									
	□ <i>on line</i> in entirety			□ work	with m	rentor			
	□ partial e-learning				(other)				
	field work     field work								
Student responsibilities	The presence on lec Performed all require	tures in ed labor	the amo atory exe	unt of at ercises.	least 7	0 % of the t	imes sc	hedu	uled.
Screening student	Class attendance	2	Researc	:h		Practical tra	aining		
work (name the proportion of ECTS	Experimental work		Report		Individual work (Other)			2	
credits for each activity so that the	Essay		Seminar essav			Laboratory exercises (Other)		es	0,5
total number of ECTS credits is equal to the ECTS	Tests		Oral exam			Preparation for laboratory exercises (Other)		es	0,5
value of the course)	Written exam		Project			(Other)			
Grading and evaluating student work in class and at the final exam	During the semester there will be two mid-term exams. The first mid-exam will be held after 7 weeks of classes, the second after the next 6 weeks. Mid-term exams are written on paper and consist of 5 tasks each. At the final exam students can takeonly the 148ystem materials that day did not pass the mid-term. At the final exam in september students take the whole subject matter of the course. The requirement for passing grade is at least 50% of points achieved on the mid-term exams or final exam. The number of points is calculated as the arithmetic average of the two mid-term exams, or the number of points of the entire final exam. The final grade is determined after the second final exam, applying the relative ECTS grading system in accordance with the Rules of study and study system of the University of Split. A group of students who passed the exam is divided into four sub-groups: 15% of the best students are graded excellent, 35% following very good, the next 35% a good grade and the last 15% positive grade. Students who did not pass the exam after two final exams take the final exam in the autumn period where they								
Required literature (available in the		Title	÷			Number copies i the libra	of Ava n of	ailab her	oility via media

library and via other media)	Lj.Šerić, Uvod u programiranje, predavanja, FESB		e-learning portal				
	M.Bugarić, upute za laboratorijske vježbe		e-learning portal				
Optional literature (at the time of submission of study programme proposal)	ck, D.: Introduction to Programming using Java, Hobart, 2000. Iorton I.: Beginning Java 2, SDK 1.4 Edition, Wrox Press 2003. I. Wiliam Smith College, on-line lecture – Java programming, February., 2001						
Quality assurance methods that ensure the acquisition of exit competences	<ul> <li>Keeping records of the class attendance</li> <li>Annual review of the performance of exam</li> <li>Student survey in order to evaluate teachers</li> <li>Self-evaluation of teachers</li> <li>Feedback from students who have already graduated from about the relevance of the course content</li> </ul>						
Other (as the proposer wishes to add)							

NAME OF THE COURSE	MAINTENANCE AND TESTING OF ELECTRICAL POWER EQUIPMENT									
Code	FENO18	Year of study	3.							
Course teacher	Božo Terzić, Ph.D., Full Professor	Credits (ECTS)	5							
Associate teachers	Goran Majić, Ph.D.	Type of instruction (number of hours)	L 30	S 0	AE 0	LE 30	DE 0			
Status of the course	Obligatory	Percentage of application of e-learning	0							
COURSE DESCRIPTION										
Course objectives	<ul> <li>understanding the methods and procedures of testing and maintenance of electrical equipment,</li> <li>permanent adoption and deepening of knowledge in the field of electrical equipment testing,</li> <li>using electrical test equipments.</li> </ul>									
Course enrolment requirements and entry competences required for the course	<ul> <li>Entry competences:</li> <li>Basic knowledge of the courses Fundamentals of Power Engineering</li> <li>Basic knowledge of the course Electrical Machines</li> <li>Basic knowledge of the course Power Plant</li> </ul>									
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<ul> <li>Students will be able to:</li> <li>use the instruments and other measuring equipment during testing,</li> <li>test electrical equipment using methods that are studied in the course,</li> <li>analyse and comment on the measurement results</li> <li>assess the condition of tested equipment based on test results,</li> <li>create and write the detailed report about measurement results.</li> </ul>									
	Course content		L hours	ہ hc	AE ours					
	Standardisation. Internation standardization (ISO, IEC, standardization and metrol		2		0					
	The program of preventive electrical equipment. Organ electrical equipment.	f	2		0					
	Isolation testing with DC vo high-voltage testing of tran machines.	nd	2		0					
Course content	Isolation testing with AC vo Power factor measurement electrical machines.	oltage. Power and dissipati ts of transformers, cables a	on fact and	or.	2		0			
detail by weekly	Types and construction of determining type and location	cables. Cable faults. Methion of the cable fault.	ods for		2		0			
(syllabus)	Type of transformers. Prev Failure diagnostics of trans	entive maintenance of tran former. Drying of transforr	nsforme ner.	ər.	2		0			
	Testing of transformer – test determination of vector gro liquid isolation.	sting of inter-turn isolation, up, measuring turns ratio,	testing	of	2		0			
	First midterm exam									
	n esting of electric machine measurement, testing of in core, on-line testing.	s – isolation system, heati ter-turn isolation, testing o	ng f iron		2		0			
	Testing of switching power switching apparatus, type t	apparatus – basic types c ests, routine tests, field test	of sts		2		0			
	Vibration testing – physical equipment for vibration me vibration states of electric r	l basis, measuring method asurement, diagnostic of i nachines.	s, rregula	r	2		0			

	Noise measurement - Physical basis of noise, measurin methods and equipment for noise measurement, source noise in electrical machines.						2	0	
	Thermal imaging of e thermography. Therr thermal imaging reco and electrical connect	electrica mal ima ording o ctions	al equipm ging cam f electrica	ent- Ph eras. E al mach	ysical ba xamples ines, tra	asics of s of insformers	2	0	
	On-line monitoring o hydrogenerator and	f electrie transfor	cal equip mer mon	ment. E itoring s	xample: system.	s of	2	0	
	Second midterm exa	am							
	List of laboratory exe	ercises						LE hours	
	The study of websites organization (ISO, IE	s of inte C, DZN	rnational M)	and nat	tional st	andards		3	
	Measurement of isola electrical machines	Measurement of isolation resistance of transformers, cables and electrical machines							
	Detecting location of	power of	cable faul	t				3	
	Testing of inter-turn is	solation	of electr	c mach	ines			3	
	Thermal imaging of p			3					
	I ype testing of switch	chinoc		3					
	Noise measurement	CHINES		3					
	On-line monitoring of	hydroa	gregate i	n HPP F	Peruča -	- field wor		6	
	⊠ lectures		0 0	_ · .					
	□ seminars and workshops								
Format of instruction	⊠ exercises				Imedia				
Format of instruction	□ on line in entirety				ratory	ontor			
	□ partial e-learning				(otho				
	☑ field work				(othe	;i <i>)</i>			
Student responsibilities	The presence on lectures in the amount of at least 70 % of the times scheduled. Performed all required laboratory exercises.								
Screening student	Class attendance	1	Researc	:h		Practical tra	actical training		
proportion of ECTS	Experimental work		Report			Individual work		1,7	
activity so that the	Essay		Semina essay	r		Laboratory exercises		1	
ECTS credits is	Tests	0,2	Oral exa	am		Preparation laboratory	n for exercises	1	
value of the course)	Written exam	0,1	Project			(Oth	ier)		
Grading and evaluating student work in class and at the final exam	Written exam0,1Project(Other)There are two midterms and final exams. The first midterm exam is after 7 weeks of lecturing and the second one is after the next 6 weeks. At the final exams students take part of course that did not pass the midterm exams. Each midterm test is carried out as written tests with duration of 60 minute and it consists of 8 questions. The requirement for passing grade is the positive assessment of laboratory exercises and 50 % points on each midterm exam. Final grade (in percentage) is formed according to the formula: Grade(%) = 0,2 LV + 0,4 (M1 + M2)where the activities in percentage:LV – laboratory assessment,M1, M2 – midterm points.The final grade is determined according to the following criteria:50-62% - sufficient (2)63-75% - good (3)76-88% - very good (4)89-100% - 151ystem sa (5)								

	Studen the aut questic where the san	Students who did not pass the exam after two final exams take a makeup exam in the autumn period on which takes the whole exam. The exam consists 10 theoretical questions and lasts 90 minutes. The percentage grade is determined by the formula: Grade(%) = $0.2 \text{ LV} + 0.8 \text{ Pl}$ where PI is percentage grade of makeup exame. The final grade is determined by the same criteria as for the two final exams.						
Required literature (available in the		Title	Number of copies in the library	Availability via other media				
library and via other media)	1. 2.	B. Terzić: Authorized lectures, FESB Ž. Novinc, A. Halep: Tehnička dijagnostika i monitoring u industriji, Kigen, Zagreb, 2010.	10	e-learning portal				
Optional literature (at the time of submission of study programme proposal)	1. 2. 3.	<ol> <li>P. Gill: Electrical Power Equipment Maintenance and Testing, Marcel Dekker, Inc, New York, Basel, 1998.</li> <li>N. Srb: Ispitivanje i prematanje elektromotora, Graphis, Zagreb.</li> <li>K. Meštrović: Sklopni aparati srednjeg i visokog napona, Graphis, Zagreb</li> </ol>						
Quality assurance methods that ensure the acquisition of exit competences	<ul> <li>Evaluation of results in accordance with the above learning outcomes</li> <li>Feedback from students via surveys</li> <li>Self-evaluation of teachers</li> <li>Institutional and non-institutional evaluations</li> </ul>							
Other (as the proposer wishes to add)								

NAME OF THE COURSE	MATHEMATICS								
Code	FEMY03	Year of study	1						
Course teacher	Ivančica Mirošević, M.Sc., Lectuter	Credits (ECTS)	7						
Associate teachers	Lea Dujić, Marija Čatipović, Marina Mandić	Type of instruction (number of hours)	L 45	S	AE 45	LE	DE		
Status of the course	obligatory								
	COURSE I	DESCRIPTION	-						
Course objectives	Course objectives Training students for: application of mathematical concepts and tools from the area of linear algebra, vector calculus, analytic geometry, diferential calculus, analysis of real functions of real variable, sequences and series of numbers and functions to solving engineering problems								
Course enrolment requirements and entry competences required for the course	Good knowledge of High School mathematics and passed State Exam in Mathematics.								
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<ul> <li>Students will be able to:</li> <li>state definitions and theorems from the enitre course,</li> <li>illustrate theorems with examples,</li> <li>solve systems of linear equations,</li> <li>apply vector calculus in engineering,</li> <li>interpret derivatives mathematically, geometrically and physically,</li> <li>analyse functions of one variable,</li> <li>test convergence of sequences and series of numbers and functions.</li> <li>identify integrals which are elementary integrable and solve them.</li> <li>analyze the extrema of real functions of several variables.</li> </ul>								
	Course content			L	or S	/ hc	AE ours		
	1. Introduction. Sets of numb	ers, complex numbers,			3		3		
	2. Matrices. Basic operations of system of linear equations independence and 153ystem theorem.	<u>mulas.</u> rmulatio Linear apelli	on	3		3			
	3. Inverse matrix. Determinar determinant. Cramer's rule.	nts. Laplace expansion of	of a		3		3		
Course content broken down in detail by weekly	<ol> <li>Vectors. Basic operations Unit vector and cosines of dir vectors and basis of a space product and mixed product.</li> </ol>	with vectors. Coordinate rections. Linear indepen- . Scalar (dot) product, ve	e systen dence o ector	n. of	3		3		
(syllabus)	5. Functions of a real variable of functions. Review of eleme	e: defining function, clas entary functions.	sificatio	n	3		3		
	6. Limits and continuity. Asyn	nptotes.			3		3		
	7. Derivatives and differentia L'Hospital's rule and limits of	I. Tangent and normal. undetermined forms.			3		3		
	8. Monotonicity. Necessary a extrema. Curvature. Sufficier concavity. Necessary and su points	nd sufficient conditions at condition for convexity fficient conditions for infl	for and lection		3		3		
	9. Examining functions and d	Irawing graphs.			3		3		
	10. Sequences of real number and convergence. Boundedn	ers. Boundedness, mono ess, monotonicity and	otonicity	/	3		3		

	convergence. Series convergence. Convergence. Convergence. P Alternating series. P	s of real ergence ower se	numbers criteria. ries of fu	. Suffici Absolute nctions	ent con e conve and cor	dition for rgence. nvergence		
	11. Indefinite integra of basic integrals. Ba	lls. Defir	nition and	l basic p	propertie ation.	es. Table	3	3
	12. Definite integrals	. Newto	on-Leibnit	z formu rals	ilae. Imp	proper	3	3
	13. The functions of several variables. Partial derivatives.							3
	List of laboratory or design exercises							LE or DE hours
Format of instruction	<ul> <li>☑ lectures</li> <li>☑ seminars and workshops</li> <li>☑ exercises</li> <li>☑ on line in entirety</li> <li>☑ partial e-learning</li> <li>☑ field work</li> <li>☑ independent a</li> <li>□ multimedia</li> <li>□ aboratory</li> <li>□ work with men</li> <li>□ (other)</li> </ul>				t assignmer entor er)	nts		
Student responsibilities	Regular attendence	to and a	active par	ticipatic	on in lec	tures and e	xcercises	
Screening student	Class attendance	3	Researc	ch		Practical tra	aining	
proportion of ECTS	Experimental work		Report			Self study		3.6
activity so that the	Essay		Semina essay	r		(Other)		
ECTS credits is	Tests	0.2	0.2 Oral exam		(Other)			
value of the course)	Written exam	0.2	Project			(Other)		
Grading and evaluating student work in class and at the final exam	During semester ini scheduled after two weeks of lectures, a exam students can remaining 20 point excercises. The con- term exam and a tot After semester, two Students which did r during final exams. Students which did comprehensive cour is 70. The condition and a total of at leas The grade is formed of FESB: 15% of the best stud next 35% students g next 35% students g and the last 15% stu Students who did no at leat 10 points, ca number of points is points. Mid-term exa exam schedule.	During semester initial exam and two mid-term exams are held. Initial exam is scheduled after two weeks of lectures, the first mid-term exam is scheduled after weeks of lectures, and the second in the week following the lectures. At the initia exam students can get 10 points, and at each mid-term exam 35 points, while the remaining 20 points are attained through assignements during lectures and excercises. The condition for passing the course is minimum 18 points on each mid- term exam and a total of at least 50 points. After semester, two final exams and a correction exam are held. Students which did not pass one mid-term exam, can take only this part of the exar during final exams. Students which did not pass any mid-term exam, take the final exam witt comprehensive course content. In that case, maximum numbers of available point is 70. The condition for passing the course is minimum 35 points in the final exam and a total of at least 50 points. The grade is formed after the second final exam according to article 75 of the Statut of FESB: 15% of the best students get the mark excellent (5), next 35% students get the mark yery good (4), next 35% students get the mark sufficient (2). Students who did not pass the course after final exams, and have obtained total c at leat 10 points, can attend the correction exam. On the correction exam maxima number of points is 100, and the minimum requirement for a passing grade is 5						
Required literature (available in the		Title	•			Number copies i the libra	of Avai n oth	ability via er media

library and via other media)	Bradić T., Pečarić J., Roki R., Strunje M.: Matematika za tehnološke fakultete, Element Zagreb, 1998. Rivier K.: Zbirka riješenih zadataka I, II, III, Veleučilište u Splitu 2003. Lecture materials on FESB e-learning portal.	https://elearnin			
Optional literature (at the time of submission of study programme proposal)	<ul> <li>Šego, B., Matematika za ekonomiste, Narodne novine, Zagreb, 2005.</li> <li>I. Slapničar, Matematika 1, FESB, Split, <u>http://lavica.fesb.hr/mat1</u></li> <li>I. Slapničar, Matematika 2, FESB, Split, <u>http://lavica.fesb.hr/mat2</u></li> <li>B. P. Demidovič, Zadaci i riješeni primjeri iz više matematike s primjeri na tehničke nauke, Tehnička knjiga, Zagreb, 1995.</li> <li>Dž. Lugić, Matematika II (metodički riješeni zadaci)</li> <li>B. Apsen, Repetitorij više matematike 1., 2., 3. i 4, Tehnička knjiga, Za</li> <li>S. Pavasović i ostali, Matematika – riješeni zadaci, Građevinski fakulte</li> </ul>				
Quality assurance methods that ensure the acquisition of exit competences Other (as the proposer wishes to add)	<ul> <li>homework</li> <li>short tests</li> <li>quizzes</li> <li>mid-term exams</li> <li>final exam</li> <li>student questionnaires</li> </ul>				

NAME OF THE COURSE	MEASUREMENTS IN POWER SYSTEM								
Code	FENO11	Year of study	2.						
Course teacher	Goran Petrović, Ph.D., Associate Professor	Credits (ECTS)	5						
Associate teachers	Juraj Alojzije Bosnić, assistant Tonko Garma, Ph.D., Assistant Professor	Type of instruction (number of hours)	L 30	LE 30	DE 0				
Status of the course	Obligatory	Percentage of application of e-learning	0						
COURSE DESCRIPTION									
Course objectives	Course objectives Training students for: - measurement voltage and current by various transducers, - recommend appropriate transducers for specific puproses - using measurement instruments specific for power systems.								
Course enrolment requirements and entry competences required for the course	None	one							
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	Students will be able to: describe and use inductive voltage transformers, describe and use inductive current transformers, describe and use electronic voltage and current transducers recommend appropriate transducers in accordance with IEC standards make energy meter calibration, use some modern instruments for power system, understand Power quality parameters								
	Course content	purse content					\E ours		
	Instrument transformers. In Equations in time and frequences for the second sec		2		0				
	Möllinger Gewecke diagrar	2		0					
	transformers. Frequency response of ins	trument transformers. Lah	ellina		2		0		
	Frequency response of instrument transformers. Labelling.						0		
	High voltage transformers.	Cascaded transformers.			2		0		
Course content	Instrument voltage and cur measurements IEC standa Electromagnetic compatibi	rent transformers for prote rds for voltage transforme lity.	nd	2		0			
broken down in detail by weekly	Error calculation procedure in accordance with IEC sta	o for stationary and transie ndards.	nt state	es	2		0		
class schedule	First midterm exam								
(syllabus)	Faults in power system and in transient state.	d current instruments for p	rotectic	on	2		0		
	Capacitive voltage transfor capacitive dividers. Optoel	mers. Voltage resistance a ectronic transducers.	and		2		0		
	Electronic current transduc loop current transducers. R	ers. Hall effect open and c Rogowski coil.	closed		2		0		
	Power quality monitoring, E analysers. Disturbance ana	EN 50160. Dynamic signal alysers. Tariff system			2		0		
	Reactive power compensa harmonics. Systems for su acquisition.	tion, and suppression of h pervisory control and data	igh		2		0		
	Measurement on grounded method. Schlumberger me	systems. Soil resistivity. V thod.	Nenne	r	2		0		

	Second midterm exa	am								
	List of laboratory exe	ercises						LE h	ours	
	Measurements of AC	; voltage	e and cur	rent by v	various	transducers			3	
	Calibration of current	transfo	rmer.					3	3	
	Calibration of 3 phase	e energ	y meter.						3	
	Measurement by usir power, voltage and c	ng of ele urrent.	ectronics	transdu	cers for	active and r	eactive	3	3	
	Measurements of pov	wer syst	tem quan	tities by	digital i	instrument.			3	
	Cable faults. Impulse	s reflec	tometry.						3	
	Monitoring of power t	ransfor	mer. (visit	ting wor	kshop)				3	
	Power quality: measu	urement	s and rep	orting				3	3	
	Practical skills exam	Practical skills exam								
Format of instruction	<ul> <li>☑ lectures</li> <li>□ seminars and workshops</li> <li>☑ exercises</li> <li>□ independer</li> <li>☑ multimedit</li> <li>☑ laboratory</li> <li>□ work with</li> </ul>				penden imedia ratory	nt assignments				
	□ partial e-learning				(ath a					
	□ field work				(othe	r)	)			
Student responsibilities	The presence on lec Performed all require	tures in ed labor	the amoratory exe	unt of at ercises.	least 7	0 % of the ti	mes sch	eduleo	J.	
Screening student	Class attendance	1	Researc	h		Practical tra	Practical training			
proportion of ECTS	Experimental work		Report			ndividual work			3	
activity so that the	Essay		Seminar essay	r		Laboratory exercises		S	0,5	
ECTS credits is	Tests	0,5	Oral exa	am		Preparation laboratory e	;	0,5		
value of the course)	Written exam	0,5	Project			(Oth	er)			
Grading and evaluating student work in class and at the final exam	There are two midter midterm exam is aft weeks. Each midtern and final tests consis exams students that The requirement for and 40 % points on formed according to the activities in perce LV – laborat M1, M2 – tes	ms and er 7 we n test co t of 10 t did not passing each mi the forn Gra entage: ory asso st result	final examples of lemonsists of lemonsists of heoretical pass the grade is find term eximula: $de(\%) = ($ essment, s.	ms that cturing a 5 theore I questic midtern the posi am or th 0,4 LV +	are carr and the etical qu ons and n exams tive ass ne final • 0,3 (M	ied out as w second one estions and numerical p s take part. essment of l exam. Grad 1 + M2)	ritten tes e is after numerica roblems aborator le (in per	ts. The the n al prob In the y exer centaç	e first ext 6 lems e final cises ge) is	
Required literature (available in the library and via other		Title	•			copies in the librar	n Avai y oth	labilit er me	y via ⊧dia	
media)	G. Petrović: Skripta	s preda	vanja, FE	SB			e-	learnir portal	ופ	
Optional literature (at the time of submission of study programme proposal)	Alan S. Morris: Signa 2006. William C. Dunn: Fui McGraw-Hill, 2005.	al Proce ndamer	essing of l	Power 0 dustrial	Quality [ Instrum	Disturbances	s, IEEE F d Proces	'ress. s Cont	trol,	
Quality assurance methods that ensure the acquisition of exit competences	<ul> <li>Evaluation of res</li> <li>Feedback from s</li> <li>Self-evaluation c</li> <li>Institutional and</li> </ul>	sults in a students of teach non-ins	accordan s via surve ers titutional	ce with t eys evaluati	the abov	ve learning o	outcome	3		

Other (as the proposer wishes to add)									
NAME OF THE COURSE	MEASUREMENTS OF PR	ROCESS QUANTITIES							
Code	FENO16	Year of study	3.						
Course teacher	Goran Petrović, Ph.D., Associate Professor	Credits (ECTS)	5						
Associate teachers	Juraj Alojzije Bosnić, assistant	Type of instruction (number of hours)	L 30	LE DE 30					
Status of the course	Obligatory	Percentage of application of e-learning	0						
	COURSE	E DESCRIPTION							
Course objectives Training students for: - signal conditioning and analogue processing of signals - measuring of different kinds of process variables									
Course enrolment requirements and entry competences required for the course	None	one							
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<ul> <li>Students will be able to:</li> <li>make basic circuits for analogue processing,</li> <li>use the basic protocols for communication between smart sensors and PC,</li> <li>make temperature sensors calibration,</li> <li>use thermal imaging camera,</li> <li>make force and pressure sensors calibration,</li> <li>recommend appropriate sensors for displacement, temperature, force, pressure, velocity, level, flow, light,</li> <li>make Labview program for monitoring, control and data acquisition</li> </ul>								
	Course content			L hours	AE hours				
	Instrument accuracy and p	arameters that affect an		2	0				
	Dynamic features of senso frequencies responses of f	2	0						
	Operation amplifier and sig summation, integration, de signals.	2	0						
Course content	Transfer signals on long dia modulations techniques.	2	0						
broken down in detail by weekly	Interfaces for signal transfe Communication protocols (	erring (USART, RS232, RS (HART, M Bus, MODBUS,	3 485). Ethernet)	2	0				
class schedule (syllabus)	Displacement sensors. Pot ultrasound, optical, magne effect sensors.	tentiometric, inductive, cap tostrictive, magnetoresistiv	acitive, /e. Hall	2	0				
	Measuring of thermal quan Thermistors. Linearization.	tities. Resistance thermon	neters.	2	0				
	First midterm exam				0				
	Thermoelectric effects. The Thermal radiation. Thermo	ermocouples. Pyroelectric graphy.	effects.	2	0				
	Pressure measurements. I Microphones.	Diaphragms, Bourdon tube	S.	2	0				
	Force and moment measurelectric transducers. Charg	rements. Strain gauges. Pi je amplifier.	ezo	2	0				

	Velocity measureme	nts. Do	ppler effe	ct. Ang	ular velo	ocity.	2	0	
	Level measurements Direct level sensing Indirect level								
			Bernou	isiriy. If Ili equat	tion		2	0	
	Flow measurement i	nstrume	ents: Pito	t tuhe (	Drifice n	late			
	Venturi tube, Rotam	eter, Tu	rbine me	ter, Ele	ctromag	netic.	2	0	
	Second midterm exa	am		,	0			0	
	List of laboratory exe	ercises						LE hours	
	Principles of Labview	coding	(Data ty	be, Inpu	it output	variables)		3	
	Loops and structures	in Lab	view. Cre	ating gr	aphical	user interfa	ce.	3	
	Static characteristics	of trans	ducers.	Displac	ement a	and tempera	ature)	3	
	Thermistor and therm	nocouple	e. Linear	zation.				3	
	Thermography. Meas	suremer	nt of ther	nal flux				3	
	Pressure, force, velo	city and	level me	asurem	ient			3	
	Educational Laborato	ory Virtu	al Instrur	nentatic	on Suite	(signal con	ditioning)	3	
	Educational Laborato	ory Virtu	al Instrur	nentatio	on Suite	(photometr	y)	3	
	Practical skills exam							Z	
				□ inde	penden	t assignmei	nts		
	□ seminars and wor	kshops		⊠ mult	timedia	0			
Format of instruction				⊠ laboratory					
	□ <i>on line</i> in entirety			□ work with mentor					
	□ partial e-learning			□ (other)					
	☐ field work				(oure	a)			
Student	The presence on lectures in the amount of at least 70 % of the times scheduled.								
Sereening student				LISES.		Dreatical tr			
work (name the	Class attendance	1	Researc	n		Practical tra	Practical training		
proportion of ECTS	Experimental work		Report			Individual work		2	
activity so that the	Essay		Semina essay	0,7 Laboratory ex		exercises	s 0,5		
ECTS credits is	Tests	0,2	Oral exa	m		Preparation for laboratory exercises		0,5	
value of the course)	Written exam	0,1	Project			(Oth			
Grading and evaluating student work in class and at the final exam	There are two midterms and final exams that are carried out as written tests. The first midterm exam is after 7 weeks of lecturing and the second one is after the next 6 weeks. Each midterm test consists of 10 theoretical questions and numerical problems and final tests consist of 20 theoretical questions and numerical problems. In the final exams students that did not pass the midterm exams take part. The requirement for passing grade is the positive assessment of laboratory exercises and 40 % points on each midterm exam or the final exam. Grade (in percentage) is formed according to the formula: Grade(%) = 0,4 LV + 0,3 (M1 + M2) the activities in percentage:								
	<ul> <li>LV – laborat</li> <li>M1, M2 – test</li> </ul>	ory asso st result	essment, s.						
Required literature (available in the library and via other		Title	•			Number copies i the libra	of Avai n oth	ability via er media	
media)	G. Petrović: Skripta	s preda	vanja, FE	SB			e-	earning portal	

Optional literature (at the time of submission of study programme proposal)	Alan S. Morris: Measurement and Instrumentation Principles. Butterworth- Heinemann, Oxford. 2001. William C. Dunn: Fundamentals of Industrial Instrumentation and Process Control, McGraw-Hill, 2005.
Quality assurance methods that ensure the acquisition of exit competences	<ul> <li>Evaluation of results in accordance with the above learning outcomes</li> <li>Feedback from students via surveys</li> <li>Self-evaluation of teachers</li> <li>Institutional and non-institutional evaluations</li> </ul>
Other (as the proposer wishes to add)	

NAME OF THE COURSE	MARINE ELECTRICAL	ENGINEERING							
Code	FENO26	Year of study			3.				
Course teacher	Slavko Vujević, Ph.D., Full Professor	Credits (ECTS)	5						
		Type of instruction	L	S	AE	LE	DE		
Associate teachers		(number of hours)	30	0	0	30	0		
Status of the course	Elective	Percentage of	0						
	COURSE	E DESCRIPTION							
Course objectives	Training students for under - marine electrical devic - marine electrical equip - marine electrical instal	rstanding and application c es and systems, ment, lations.	of spec	ialized	knowl	edge	of:		
Course enrolment requirements and entry competences required for the course	None	one							
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<ul> <li>Students will be able to:</li> <li>describe the basic prin describe the basic prin distribution,</li> <li>describe the basic prin describe high voltage p</li> <li>define safety rules for compare the features of use of normative docur</li> <li>apply the requirements national maritime administrational maritime</li> </ul>	describe the basic principles of ship's electric power generation, describe the basic principles of ship's electric power transmission and distribution, describe the basic principles of ship's electric power consumption, describe high voltage power system on ships, define safety rules for working with electrical equipment on ships, compare the features of marine power systems and terrestrial power systems, use of normative documents in the field of marine electrical engineering, apply the requirements of classification societies and the requirements of national maritime administrations.							
	Course content		Marine		.'	Lho	ours		
	power generation.	p's electric power system.	wanne	electi	IC .	2	2		
	Marine electric propulsion.					4	4		
	Marine electric power trans	mission and distribution.				(	6		
	Marine electric power cons	sumption.				4	4		
	Marine instrumentation.					2	2		
	Ship's high voltage electric	power system.				4	4		
Course content	The dangers of electricity. working with electrical equi ships.	Protection and safety mean ipment. Safety and security	sures v / meas	when sures c	n	2	2		
broken down in detail by weekly class schedule	Standardization of marine of Requirements of classification maritime administrations.	electrical engineering throu tion societies and requirem	ugh IE( ients c	C and f natio	ISO. nal		2		
(Syllabus)	List of laboratory exercises					IFh	oure		
	Marine electric nower conc	aration					3		
	Marine electric propulsion	allon					3 3		
	Marine electric propulsion	smission					<u>,</u> २		
	Marine electric power distri	ihution					3		
	Shin's high voltage electric	nower system					3		
	Marine electric power cons	sumption					3		
	Optimization of shin's elect	tric power system					3		
	Safety and security measu	res on ships					3		
	Professional visit to ships i	n shipyard				(	6		

Format of instruction	<ul> <li>☑ lectures</li> <li>□ seminars and workshops</li> <li>□ exercises</li> <li>□ on line in entirety</li> <li>□ partial e-learning</li> <li>□ field work</li> <li>□ field work</li> </ul>			t assignments entor r)				
Student responsibilities	Attendance on lecture Performed all require	tendance on lectures in the amount of at least 70 % of the times scheduled. erformed all required laboratory exercises.					l.	
Screening student	Class attendance	2	Researc	:h		Practical traini	ng	
proportion of ECTS	Experimental work		Report			Individual work	K	1.7
credits for each activity so that the	Essay		Seminar essay		Laboratory exe	ercises	0.8	
ECTS credits is equal to the ECTS	Tests	0.2	Oral exam la		Preparation fo laboratory exe	r rcises	0.2	
value of the course)	Written exam	0.1	Project			(Other)		
Grading and evaluating student work in class and at the final exam	Inere are two midte entire exam. In the tr pass in the prelimina two course parts, tha final exam. The requised student has complet (in percentage) can Grade (% where activities in per- the first course part, Students who did no exam in the addition course. The requirer the student has com- grade (in percentage Grade (% where activities in per- entire course. The final grade can 50 % to 61 % 50 % to 87 % 88 % to 100 % Each of the midterm and two additional ex-	rm exan wo final ary exan at course irement ed at lea be calcu ) = $0.1^{*1}$ ercentag G2 - po t pass the al exam nent for pleted a e) can be ) = $0.1^{*1}$ ercentag be calcu ) = $0.1^{*1}$	ns. After 1 exams since and the part the part the part the for a post so % and the part the since and the part the since and the part the since are since the part of the par	two midi tudents is first fi e studen sitive ev points fi ng the fo is (G1 + / – labou e asses 0 % point two add e asses 0 % point ted usin G / – labou follows:	term exit take con nal exar t does r aluation rom that ormula: G2) ratory a cond con fter two itional e sment con ts from g the fo ratory a cond con fter two itional e sment con ts from g the fo	ams, student c urse parts that m student pass not have to take of the course t course part. T ssessment, G1 urse part. final exams ca exams students of the additiona the entire cour rmula: ssessment, G	an pass they did r ses one of e in the se part is tha The final g I – points an pass the take the I exams is rse. The fi – points fr	ne not the econd at the rade from e entire s that inal rom the
Required literature		Title	)			copies in the library	Availabi other r	lity via nedia
(available in the library and via other media)	Vujević, S., "Predava elektrotehnika (511) Split, 2014. (lecture	anja iz p ', Sveuč notes –	oredmeta Silište u S electronio	Brodska plitu, FE c version	a SB, n)		e-lear port	ning tal
	Sveučilište u Dubrov	i elektrið miku, Di	ubrovnik,	/i i uređa 2005.	aji",	5		
Optional literature (at the time of	<ul> <li>Hall, D.T., "Prac Witherby ✓ Co L</li> </ul>	tical Ma ₋td, 199	rine Elect 9.	trical Kn	owledg	e – Second Re	evised Edi	tion",

submission of study programme proposal)	<ul> <li>McGeorge, H.D., "Marine Electrical Engineering and Practice – Second Edition", Butterworth-Heinemann, 1993.</li> <li>Skalicki, B. i Grilec, J., "Brodski električni uređaji", Sveučilište u Zagrebu, FSB, Zagreb, 2000.</li> </ul>
Quality assurance methods that ensure the acquisition of exit competences	<ul> <li>Evaluation of results in accordance with the above learning outcomes</li> <li>Feedback from students via surveys</li> <li>Self-evaluation of teachers</li> <li>Institutional and non-institutional evaluations</li> </ul>
Other (as the proposer wishes to add)	

NAME OF THE COURSE	MARITIME RADIOCOMMUNICATIONS								
Code	FELO40	Year of st	tudy	3.					
Course teacher	Antonio Šarolić, Ph.D., Full Professor	Credits (E	ECTS)	4					
Associate teachers	Niko Ištuk, mag. ing. el.	Type of ir (number	nstruction of hours)	L 30	S	AE	LE 15	DE	
Status of the course	elective	Percenta	ge of	0			10		
	COURSE		PTION						
Course objectives	Training students for: - understanding the spec- - acquiring knowledge of	cificities of n maritime	maritime radioc	commu	nicati syster	ons ns			
Course enrolment requirements and entry competences required for the course	None.				2				
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	Students will be able to: - describe the specificitie - apply the knowledge of - identify the maritime radio - use the maritime radio	udents will be able to: describe the specificities of maritime radiocommunications apply the knowledge of radiocommunications to maritime applications identify the maritime radiocommunication devices and systems in use use the maritime radiocommunication systems							
	Course content					L or S hours	/ hc	\E ours	
	Introduction to maritime rac	diocommu	nications.			2		0	
	Basics of maritime telecom	municatio	ns.			2		0	
	Basics of maritime radiocol	mmunicati	ons.			4		0	
	Terrestrial radio links.					2		0	
	Satellite radio links.					2		0	
	Terrestrial radiocommunication systems.					2	0		
	Satellite radiocommunication systems. 2							0	
	GMDSS system.					2		0	
Course content	Shipboard navigational rad	ar.				2		0	
broken down in	GPS.					2		0	
detail by weekly	Visit to systems in use (field trip).							0	
class schedule	List of laboratory or design	exercises					LE ( hc	or DE ours	
(0)10000)	Introduction to maritime rad	liocommur	nications.					1	
	Basics of maritime telecom	municatior	IS.					1	
	Basics of maritime radiocon	nmunicatio	ons.					2	
	l errestrial radio links.							1	
	Satellite radio links.	1						1	
	l errestrial radiocommunica	tion syster	ns.					1	
		on systems	j.					1	
	GWD35 System.	~ -						1	
	Shipboard havigational rada	ar.						1	
	Uro. Visit to systems in uso (field	trin)						2	
		<i>i</i> iiip).						2	
	<ul> <li>seminars and workshops</li> <li>exercises</li> </ul>	S	<ul><li>□ independent</li><li>□ multimedia</li></ul>	assigr	nment	S			
Format of instruction	$\square$ on line in entirety		☑ laboratory						
	□ nartial e-learning		🗆 work with me	entor					
	⊠ field work		□ (other	-)					

Student responsibilities	Student is required t least 70% of the sch the amount of 100% laboratory exercises	o attend edule. S of the s	I the lectures and Student is require schedule and to d	d audito ed to att complet	ry exercises in end the laborat e all tasks asso	the amou ory exerc pciated wit	int of at ises in th
Screening student	Class attendance	1,5	Research		Practical traini	ng	
proportion of ECTS	Experimental work		Report		Laboratory exe	ercises	0,5
activity so that the	Essay		Seminar essay	0,5	Individual work	K	0,5
ECTS credits is	Mid-exam	0,5	Oral exam		(Other)		
value of the course)	Written exam	0,5	Project		(Other)		
Grading and evaluating student work in class and at the final exam	During the semester the middles of the s exercises are compl The first mid-exam is exam is based on th To pass at each mid exam containing nu 50% of points must from the lectures). To earn the right to earned from the par from auditory exercis first mid-exam conta If a student earns th have passed the wh exams. At the first exam ter half of the material th At all other exam tern material. Approaching the e responsibilities. The overall point per of points earned in a Percentage -> Grad 50% - 62,4% -> suff 62,5% - 74,9% -> go 75% - 87,4% -> very 87,5% - 100% -> ex Final grade can be individual and exper Exam terms: accord	r, two m semeste eted, sc s based e first se d-exam, merical be earno approa t of the ses) and ining to the supplet imental ing to the	id-exams will be r, while the sec hedules to be ac on the first half of econd half of the min. 50% of poi problems (mate- ed from the part ch the second r first mid-exam of d min. 30% of poi eory (material from ve grades on both m with the grades ents may choose haven't passed ents must take the s subject to find e defining the over questions, correct () 4) 5) mented by perfor- work, in agreem e academic yea	held. T ond will greed wi of the co course nts mus erial from of the e mid-exal containin ints mus om the k oth mid- e calcula e to take at mid-e ne whole ulfilling erall gra ected by	he first mid-exa be held after th the students ourse material. t be earned fro n auditory exe xam containing m, min. 30% o or numerical pro- st be earned fro ectures). exams, he/she ated as averag e the exam cor- exams. e exam, contain the requirement ade is calculated the result of or- practical project the teacher. ar	am will be the lectur The seco m the par rcises) an g theory (r f points n oblems (r om the pa is consid e from bo ntaining o ing all the ents on d as the a al verifica	held in res and nd mid- rt of the nd min. material nust be material rt of the lered to oth mid- nly that e course student average tion:
		Title	•		Number of copies in the library	Availabi other r	ility via nedia
Required literature (available in the	Kim, J.C., Muehldor	t, E.I., N tems, P	aval Shipboard rentice Hall, 199	5.			
library and via other media)	Lees, G.D., Williams Communications, Lle 1999.	son, W.G oyds of	G., Handbook for London Press, L	<sup>·</sup> Marine ondon,			
	Law, Preston E. Jr, S House, Boston, 198	Shipboa 6.	rd Antennas, Art	tech			

Optional literature (at the time of submission of study programme proposal)	<ul> <li>Zentner, E,. Antene i radiosustavi, Graphis, Zagreb, 2001.</li> <li>Law, Preston E. Jr, Shipboard Electromagnetics, Artech House, Boston, 1987.</li> <li>Šarolić, A., Elektromagnetska kompatibilnost brodskih RF uređaja, (magistarska disertacija), EER, 2000.</li> </ul>
Quality assurance methods that ensure the acquisition of exit competences	Surveys providing student feedback
Other (as the proposer wishes to add)	

NAME OF THE COURSE	MECHATRONICS PRACTICALS								
Code	FELO48	Year of study	3						
Course teacher	Vladan Papić, Ph.D., Full Professor Mirjana Bonković, Ph.D., Full Professor	Credits (ECTS)	5						
Associate teachers	Miroslav Dujmović, BSc (external collaborator)	Type of instruction (number of hours)	LE 45	DE 0					
Status of the course	Elective	Percentage of application of e-learning	0						
	COURSE	E DESCRIPTION							
Course objectives	<ul> <li>Training students:</li> <li>to understand and to a mechanical engineerin functionality</li> <li>to understand and to b components</li> <li>to understand the princ program them</li> </ul>	aining students: to understand and to apply basic knowledge from the field of electronics, mechanical engineering and computer science for intelligent systems functionality to understand and to be able to analyze mechatronics systems and their components to understand the principle of mechatronic system control and to learn how to program them							
Course enrolment requirements and entry competences required for the course	None								
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<ul> <li>Students will be able to:</li> <li>describe the basic elements of the mechatronic system</li> <li>describe the functionality of the elements of mechatronic system</li> <li>analyze the functionality of the mechatronic system</li> <li>program the microcontrollers</li> <li>calculate the parameters of the system components</li> <li>demonstrate the functionality of the face these systems</li> </ul>								
	Course content					L o	or S ours		
	Introduction to mechatronic	S					2		
	Feedback control						1		
	Mechanisms for the transfe	er of movement					1		
	Microcontrollers and micro	controller programming					2		
	Electronic circuits and med	hatronic system compone	nts				2		
	Sampling and signal conve	ersion					2		
Course content broken down in detail by weekly	Sensors: sensor characteri types: incremental encoder sensors, vision sensors.	stics, uncertainty represer rs, position and orientation	ntation, senso	senso ors, ine	r rtial		1		
ciass schedule	Electrical actuators (AC an	d DC motors, solenoids)					2		
	Mechatronic systems						1		
	List of laboratory or design	exercises				LE o ho	or DE ours		
	Instrumentation, elements a	and breadboard				_	2		
	DC motor control	- 4					2		
	Nicrocontroller programmin						2		
	Project task	ly ∠					∠ ∕_		
	Project task demonstration						4		

	☑ lectures			🗆 inde	penden	ndent assignments				
	☑ seminars and wor	kshops		⊠ individual tasks						
Format of instruction	exercises			⊠ mult	timedia					
	□ <i>on line</i> in entirety			⊠ labo	oratory	У				
	□ partial e-learning			□ worl	k with m	ientor				
	☐ field work				(othe	er)				
Student	The presence on lec	tures in	the amo	unt of a	t least 7	'0 % of the time	s schedul	ed.		
						<b>D</b>				
work (name the	Class attendance	ss attendance 0,5 Research P				Practical traini	ng	0.7		
proportion of ECTS credits for each	Experimental work		Report Seminar					0,7		
activity so that the total number of	Essay		essay		2	Laboratory exe	ercises	1,5		
ECTS credits is equal to the ECTS	Tests	0,2	Oral exa	ım		Preparation for laboratory exe	r rcises	0,2		
value of the course)	Written exam	0,1	Project			(Other)				
Grading and evaluating student work in class and at the final exam	weeks of fectures and the second one is after 13 weeks of fectures. The first midter test is carried out in a written format with duration of 90 minutes. The requirement for passing grade is the positive assessment of laboratory exercises (10%), 50 % point for the midterm tests (40%) and positively evaluated presentation and defense of the project assignment (50%). Students are allowed to have at least 10% of total point on midterm exams, as long as the final average is at least 50% of total points. Grade (in percentage) is formed according to the formula: Grade(%) = 0,1L + 0,2M1 + 0,2M2 + 0,5*FP where: • L – laboratory assessment, • M1, M2 – midterm test results. • FP – final project. According to Article 65. of Faculty's Bylaw, student is required to participate in a teaching activities attending at least 70% of lectures, and 100% of laborator exercises. If student does not meet these criteria, she or he won't be able to take pa									
Required literature (available in the		Title	•			Number of copies in	Availabi other n	lity via nedia		
library and via other						the library		ming		
media)	1. Papić, Meha	atronika,	lecture r	otes, F	ESB.		e-Lear	ning		
Optional literature (at the time of submission of study programme proposal)	<ol> <li>Sabri Cetink</li> <li>Bateson, Int</li> </ol>	unt: Me roductio	chatronic on to Con	s, John trol Sys	Wiley & tem Teo	& Sons, 2006. chnology, Prent	ice-Hall, 2	2002.		
Quality assurance methods that ensure the acquisition of exit competences	<ul> <li>Keeping records of student attendance.</li> <li>Annual analysis of course statistics in terms of midterm and finals exams.</li> <li>Feedback from students via surveys.</li> <li>Teacher self-evaluation.</li> <li>Feedback from graduated students (or senior students) on course content relevance.</li> <li>Periodic institutional evaluation of course teachers.</li> </ul>							ams.		
proposer wishes to add)	1									

NAME OF THE COURSE	MICROCONTROLLERS AND EMBEDDED NETWORK SYSTEMS											
Code	FELO39	Year of study	2.									
Course teacher	Asst. prof. Ivo Stančić, PhD	Credits (ECTS)	4									
		Type of instruction	L	S	AE	LE	DE					
Associate teachers		(number of hours)	30	0	0	15	0					
Status of the course	Obligatory	Percentage of application of e-learning										
	COURSE	DESCRIPTION										
Course objectives	Training students: - to develop an under embedded systems - to develop an under - to be familiar with o - to be able to cre Ethernet network a	<ul> <li>taining students:</li> <li>to develop an understanding for the purpose and the design principles of the embedded systems</li> <li>to develop an understanding of basic microcontroller architecture</li> <li>to be familiar with concept of microcontroller interfaces</li> <li>to be able to create embedded system that communicates via a local Ethernet network and the Internet</li> </ul>										
Course enrolment requirements and entry competences required for the course	Finished programming course.											
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<ul> <li>Students will be able to:</li> <li>define and understand the basic concepts related to the process of designing the embedded system.</li> <li>define and understand the interfacing techniques</li> <li>program the related microcontrollers' peripheral systems to establish the appropriate functionality of the embedded system</li> <li>design the embedded system in the Arduino environment that reflect the functionality based on the information processing acquired from the sensors.</li> <li>apply a procedure that provides network data transmission from sensor to the processing unit</li> <li>apply a procedure which ensures the functionality of the embedded system</li> </ul>											
	Course content					Lo	or S ours					
	Introduction to microcontro	llers					2					
	Arduino platform and progr	amming					2					
	Project design and docume	entation					2					
	AVR arhitecture						2					
	ADC						4					
	Real time clock. Timers.						2					
Course content	Interrupts. Programming in	terrupts.					2					
broken down in detail	Serial BUS (IIC, SPI, UART	Г)					4					
by weekly class	Sensors, actuators, indicate	ors					2					
schedule (syllabus)	Local wired networks (Ethe	rnet) and wireless network	ks (RF)				4					
	Energy optimization						2					
	Optimization of the embedo	ded system regarding the e exercises	energy o	consum	ption	LE	2 or DE					
	Introduction to the Ardu components and programm	uino development envir ning mode.	onmen	t: haro	dware		2					
	Digital input - output Serial Monitor											
	Analog input PWM output						2					
	r indiog input. I wive output.					1	<u>~</u>					

	Sensors and serial Bl	JS						2	
	Energy optimisation.	Librarie	es					2	
	Ethernet							2	
	RF modems							2	
	Project design and d	ocumen	tation					2	
	⊠ lectures	I lectures							
	seminars and wor	kshops			ependen timodio	lassignments			
Format of instruction	⊠ exercises								
	□ <i>on line</i> in entirety				k with m	ontor			
	□ partial e-learning				(othe	r)			
-	☐ field work				(ouro	')			
Student responsibilities									
Screening student work (name the	Class attendance	1,5	Researc	h		Practical trainir	ng		
proportion of ECTS credits for each	Experimental work		Report			Individual work		0,5	
activity so that the	Essay		Seminar	-	1	Laboratory exe	ercises	0,7	
ECTS credits is	Tests	01,	Oral exa	ım		Preparation laboratory exer	for cises	0,1	
value of the course)	Written exam	0,1	Project			(Other)			
Grading and evaluating student work in class and at the final exam	<ul> <li>weeks of lectures and the second one is after 13 weeks of lectures. The first midterm test is carried out in a written format with duration of 90 r The requirement for passing grade is the positive assessment of lat exercises, 50 % points for the both midterms and positively evaluated pres and defense of the project assignment. Grade (in percentage) is formed according to the formula:</li> <li>Grade(%) = 0,4ZP + 0,3M1 + 0,3M2</li> <li>where: <ul> <li>ZP – final project</li> <li>M1, M2 – midterm test results.</li> </ul> </li> <li>According to Article 65. of Faculty's Bylaw, student is required to participate teaching activities attending at least 70% of lectures, and 100% of lat exercises. If student does not meet these criteria, she or he won't be able to t</li> </ul>							te in all poratory ake part	
		Title	2			Number of copies in	Availabi	lity via	
						the library	other r	nedia	
	Steven F. Barre	ett, A	rduino	Microc	ontroller	Ĭ			
	Processing for Eve	ryone!,	Synthesi	s Lect	ures on				
Required literature	Digital Circuits and	Systen	ns, worg	an & (	Jaypool				
(available in the	David Russeell Intro	oduction	to Embe	edded S	Systems				
library and via other	Using ANSI C ar	nd the	Arduino	Deve	lopment				
media)	Environment, Synthesis Lectures on Digital Circuits								
	and Systems, Morga	an & Cla	ypool Pu	blishers	s, 2010.				
	Michael Predko, Handbook of Microcontrollers, Tab Books, 1998.								
	M. Bonković, J. Musić, I. Stančić, Mikroregulatori i ugradbeni mrežni sustavi, FESB, 2014.				e-learnin	g			

Optional literature (at the time of submission of study programme proposal)	<ol> <li>Bonković, Mirjana; Musić, Josip; Stančić, Ivo, Mikroregulatori i ugradbeni mrežni sustavi u Arduino razvojnom okruženju , Split : Fakultet elektrotehnike, strojarstva i brodogradnje, 2014</li> <li>Claus Kuhnel, Klaus Zahnert, BASIC Stamp : An Introduction to Microcontrollers, Newnes, 2000.</li> <li>Han-Way Huang, PIC Microcontroller, Thomson Delmar Learning, 2004.</li> <li>Jan Axelson: Embedded Ethernet and Internet complete, Lakeview Research LLC, 2003., ISBN: 1-931448-00-0</li> <li>Instructions for laboratory exercises MRUMS (512)</li> </ol>
Quality assurance methods that ensure the acquisition of exit competences	<ul> <li>Keeping records of student attendance.</li> <li>Annual analysis of course statistics in terms of midterm and finals exams.</li> <li>Feedback from students via surveys.</li> <li>Teacher self-evaluation.</li> <li>Feedback from graduated students (or senior students) on course content relevance.</li> <li>Periodic institutional evolution of course teachers.</li> </ul>
Other (as the proposer wishes to add)	

NAME OF THE COURSE	MICROPROCESSORS									
Code	FENO30 Year of study 3.									
Course teacher	Ozren Bego, Ph.D., Associate Professor	Credits (ECTS)	5							
Associate teachers	doc. dr. sc. Danijel Jolevski	Type of instruction (number of hours)	L 30	S	AE	LE 30	DE			
Status of the course	Elected	Percentage of	0	0	50	0				
	COURSE	E DESCRIPTION								
Course objectives       Training students for:         -       understanding concept of microprocessors and its periphery,         -       programing microprocessors in assembler,         -       design of simpler embedded computer devices.										
Course enrolment requirements and entry competences required for the course	None.									
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<ul> <li>Students will be able to:</li> <li>define and choose microprocessor in embedded system,</li> <li>design microprocessor based device,</li> <li>program microprocessor,</li> <li>analyze quality and functionality of embedded computer system.</li> </ul>									
	Course content		•		L or S hours	ہ hc	AE burs			
	Introduction in course. Intro	oduction in microprocesso	rs.		2					
	Standard microprocessor a	2								
	Model of Atmel ATmega16	microcontroller.			2					
	Addressing modes. Review		2							
	Microprocessor instructions instructions.		2							
	Microprocessor busses. Mo	emory types			2					
	Concept of transfer data be I/O. Review of ATmega16	etween I/O and CPU; prog periphery.	rammir	ng	2					
broken down in	Interrupted access to perip	hery. Application on ATme	ega16.		2					
detail by weekly	Periphery: A/D and D/A co	nvertors.			2					
class schedule	Periphery: parallel data tra	nster.			2					
(syllabus)	asynchronous serial transf	er.			2					
	Standards and protocols for	or serial data transfer.			2					
	Higher languages for micro	processor programing.			2					
	List of laboratory or design	exercises	(D. Otor	Ľ.,			or DE			
Introduction in Fasy AVR 54 platform for development embedded							3			
	introduction in Easy AVR 5A platform for development embedded system with Atmel microcontrollers.						3			
	Programing ATmega16 – instructions.						<u>6</u> 2			
	Peripheral of ATmega16 – Interrupts. Peripheral of ATmega16 – timer/counter_PWM									
	Peripheral of ATmega16 – ADC, comparator, LCD.									

	Seminar: Design of e assignments.	Seminar: Design of embedded computer system; independent/group 12 Issignments.							
Format of instruction	<ul> <li>☑ lectures</li> <li>☑ seminars and workshops</li> <li>☑ exercises</li> <li>□ on line in entirety</li> <li>□ partial e-learning</li> <li>□ field work</li> </ul>			<ul> <li>☑ independent assignments</li> <li>□ multimedia</li> <li>☑ laboratory</li> <li>□ work with mentor</li> <li>□ (other)</li> </ul>					
Student responsibilities								_	
Screening student	Class attendance	1	Researc	h		Practical training	ng		
proportion of ECTS	Experimental work		Report			Laboratory atte	endance	e 1	
credits for each activity so that the	Essay		Seminai essay		1.5	Independent w	vork	1	
total number of ECTS credits is equal to the ECTS	Tests		Oral exa	ım		Preparation for laboratory wor	r K	0.5	
value of the course)	Written exam		Project			(Other)			
Grading and evaluating student work in class and at the final exam	<ul> <li>in last week of semester. Grade (in percentage) is formed according to the formula: Grade(%) = 0,05 NP + 0,1 LV + 0,85 IA</li> <li>the activities in percentage: <ul> <li>NP - attendance at lectures,</li> <li>LV – laboratory assessment,</li> <li>IA – independent assigment.</li> </ul> </li> </ul>								
Required literature (available in the		Title	;			Number of copies in the library	Availa other	bility via media	
media)	O. Bego: Predavanja računalni sustavi, FE	a iz prec ESB	lmeta Ug	radbeni	i		e-lea po	arning ortal	
Optional literature (at the time of submission of study programme proposal)									
Quality assurance methods that ensure the acquisition of exit competences	<ul> <li>Evaluation of results in accordance with the above learning outcomes</li> <li>Feedback from students via surveys</li> <li>Self-evaluation of teachers,</li> <li>Institutional and non-institutional evaluations</li> </ul>								
Other (as the proposer wishes to add)									

NAME OF THE COURSE	MODELLING AND SIMULATION									
Code	FELO23	Year of study	3							
Course teacher	Jadranka Marasović, Ph.D., Full Professor Mojmil Cecić, Ph.D., Full Professor	Credits (ECTS)	5							
Associate teachers	Marko Lete, mag. ing.	Type of instruction (number of hours)	S 0	AE 0	LE 30	DE 0				
Status of the course	Elective Percentage of application of e-learning 0									
COURSE DESCRIPTION										
Course objectives Training students for: - understanding different methods of modeling and simulation, - application of different methods of modeling and simulation, - simulation of complex systems, - permanent adoption and deepening of knowledge in the field of control - application of complex systems, - permanent adoption and deepening of knowledge in the field of control - application of complex systems, - a										
Course enrolment requirements and entry competences required for the course	None									
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<ul> <li>Students will be able to:</li> <li>derive mathematical model of the simple systems,</li> <li>describe different electrical and mechanical circuits using differential equations,</li> <li>optimize systems,</li> <li>use software packages VISSIM, MATLAB – Simulink,</li> <li>design simulation model using different procedures,</li> <li>solve complex task of simulation different systems.</li> </ul>									
	Course content			l	_ or S nours	A ho	\E ours			
	Mathematical modeling				3					
	Modeling approach				2					
	Passive and active electric	al circuits, fundamental lav	vs		3					
	Analogous systems				2					
	Optimization of the model				2					
	Analog simulation				2					
	Operational amplifier				2					
	Basic elements of the anal	og simulation			2					
Course content	Methods of the analog sime	ulation			2					
broken down in detail by weekly	Transfer function simulation	n			2					
class schedule	The basic of digital simulat	ion			2					
(syllabus)	Simulation software package	ge – VISSIM, MATLAB			2					
	List of laboratory or design	exercises				LE c ho	or DE ours			
	Basic elements of analog si summer, integrator, differer	mulation (operational amp ntiator	olifier, ir	verter	,					
	VISSIM, rundamentals									
	Kelvin's feedback method	ineniais								
	Beck's method									
	Johnson's method									
	Transfer function simulatior	)								
	Simulation using RC netwo	rks (passive and active)								

	Simulation of comple servo system, chemic	x syster	ns (DC n ess)	notor, hy	/draulic	pump, position	al	
Format of instruction	☑ lectures       ☑ inde         □ seminars and workshops       □ mult         □ exercises       □ mult         □ on line in entirety       □ worl         □ partial e-learning       □         □ field work       □			ependent assignments Itimedia oratory rk with mentor (other)				
Student responsibilities	The presence on lect Performed all require	tures in ed labor	the amo atory exe	unt of at	t least 7	0 % of the time	es schedu	uled.
Screening student work (name the	Class attendance	2,0	Researc	h		Practical training	ng	
proportion of ECTS	Experimental work		Report			Individual work	ĸ	2,5
activity so that the	Essay		Seminai essay		0,2	(Other)		
ECTS credits is	Tests	0,2	Oral exa	ım		(Other)		
equal to the ECTS value of the course)	Written exam	0,1	Project			(Other)		
Grading and evaluating student work in class and at the final exam	The requirement for and 50% points on e formed according to where L is laboratory exams in percentage Each midterm test c final test also consis into two groups (the 50% of the total nur exams take part in t written tests. Finally from 50% to from 62.5% t from 75% to from 87.5% t	There are two midterms and final exams. The first midterm exam is after 7 weeks lecturing and the second one is after the next 6 weeks. The requirement for passing grade is the positive assessment of laboratory exercise and 50% points on each midterm exam or the final exam. Grade (in percentage) formed according to the formula: Grade [%] =0,25*L+0.375* (M1 + M2) where L is laboratory assessment and M1 and M2 are the results of the midterm exams in percentage. Each midterm test consists of 10 theoretical questions and numerical problems ar final test also consists of 10 theoretical questions and numerical problems divide into two groups (the first and the second part). The requirement for passing grade 50% of the total number of questions. The students who did not pass the midter exams take part in the final exam. The midterm and final exams are carried out a written tests. Finally grade is determined as follows: from 50% to 62.5% - dovoljan (2) from 62.5% to 75% - dobar (3) from 75% to 87.5% - vrlodobar (4) from 87.5% to 100% - izvrstan (5)						
		Title	•			Number of copies in	Availab	oility via
Poquirod literaturo						the library	other	media
(available in the	Zanchi, V.: Simulacij Maričić, A.: Modelira	a, Sveu	čilište u S	Splitu, 1	996. ranih	5		
library and via other media)	sustava, Sveučilišna	naklada	a Liber, Z	agreb,	198.	1		
	Marasović, J.: Kvantitativno i kvalitativno modeliranje i simuliranje, interna skripta, FESB, Split, 20003.				e – lea poi	arning rtal		
Optional literature (at the time of submission of study programme proposal)	<ul> <li>MATLAB – Simulink, User Guide</li> <li>VISSIM, User Guide</li> <li>Marasović, J.: Uvod u operacijska istraživanja, interna skripta, FESB, Split, 2000.</li> </ul>							

Quality assurance methods that ensure the acquisition of exit competences	<ul> <li>Evaluation of results in accordance with the above learning outcomes</li> <li>Feedback from students via surveys</li> <li>Self-evaluation of teachers</li> <li>Institutional and non-institutional evaluations</li> </ul>
Other (as the proposer wishes to add)	

NAME OF THE COURSE	MOBILE COMMUNICATION NETWORKS									
Code	FELO37	Year of study	3.							
Course teacher	Dinko Begušić, Ph.D., Full Professor	Credits (ECTS)	4							
Associate teachers	Maja Stella, Ph.D., Assistant Professor Marina Rajič, Mag. ing. Josip Žilić, Magl. ing. Ante Dagelić, Mag. Ing,	Type of instruction (number of hours)	L 30	S 0	AE 0	LE 15	DE 0			
Status of the course	Obligatory	Percentage of application of e-learning								
	COURSE	E DESCRIPTION								
Course objectives	<ul> <li>understanding and application of basic concepts and technologies of wireless communication systems,</li> <li>collaboration in design, development and maintenance of wireless communication networks,</li> <li>collaborate in design, development and maintenance of optical communication systems and networks,</li> <li>permanent adoption and deepening of the knowledge in the area of wirelessl communication systems and networks.</li> </ul>									
Course enrolment requirements and entry competences required for the course	None									
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<ul> <li>Students will be able to:</li> <li>identify, select and apply wireless communication systems and networks,</li> <li>collaborate in design, implementation and maintenance of mobile networks (NMT, GSM, GPRS, EDGE, UMTS, HSDPA, LTE),</li> <li>collaborate in design, implementation and maintenance of wireless access networks (WIMAN),</li> <li>collaborate in design, implementation and maintenance of wireless local area networks (WLAN, IEEE 802.11x),</li> <li>collaborate in design, implementation and maintenance of wireless personal area networks (WPAN, Bluetooth),</li> <li>collaborate in design, implementation and maintenance of ad-hoc networks,</li> <li>collaborate in design, implementation and maintenance of sattelite commnication networks (LEO, MEO, GEO),</li> <li>collaborate in development of services based on wireless communication networks,</li> </ul>									
	Course content			L	or S	/ hc	λE			
	Basic characteristics of wire (feding, multipath propagat	eless communication char ion, Doppler effect).	nels		2		-			
Course content	Digital signal processing ar commnications.	nd diversity combining in w	vireless		2		-			
broken down in detail by weekly	Multiple access techniques CDMA, OFDMA).	and multiplexing (FDMA,	TDMA,		2		-			
class schedule	Cellular systems. Interferer	nce. Coverage.			2		-			
(syllabus)	Mobile networks evolution.	First generation networks		_	2		-			
	Second generation network		2		-					
	Implementation and application	ation of discrete time system	s. ms		2		-			
	GSM system: logical chanr networks 2G+; GPRS, EDC	nels, layered model. 3 Mo GE.	bile		2		-			

	Mobile networks 3G-	+ (UMT	S, HSPA	).			2	-		
	Mobile networks 4G.	LTE,	LTE-A). I	Mobile r	network	s 5G.	2	-		
	Wireless access net	works. (	(WMAN);	IEEE 8	02.16. \	Vireless				
	local networks (WLA	N); IEE	E 802.11	x. Wirel	less per	sonal area	2	-		
	networks (WPAN); E	Bluetoot	h., IEEE 8	302.15	-					
	Satellite commnicati	on netw	orks (LE	D, MEO	, GEO)					
	178nalyse178sin wir	eless c	ommunic	ation ne	tworks.	Mobile	2	-		
	computing and mobi	le interr	net.							
	List of laboratory or	docian (	ovorciooo					LE or DE		
		Jesign	576101363					hours		
	Configuration of IEEE			2						
	Throughput measure	vorks,		2						
	Configura and throug	systems.		2						
	Signalling in GSM ne		2							
	Signalling in UMST n			2						
	Signalling in LTE net			2						
	Synchronization in m	obile ne	etworks.					2		
	☑ lectures			□ inde	nondor	t assignme	ote			
	seminars and wor	kshops			imodio	it assignmen	113			
Format of instruction	⊠ exercises									
Format of instruction	□ <i>on line</i> in entirety				oratory					
	□ partial e-learning									
	$\Box \text{ field work} \qquad \Box \qquad \text{(other)}$									
	•									
	D Begušić: Wireless and mobile communication networks, handouts									
Student	D. Begusic: wireless and mobile communication networks, handouts									
responsibilities	Optional interature (at the time of submission of study programme proposal) □ IFEE Communications Magazine. □ Documents of standardization institutions									
	□ TEEE Communications magazine. □ Documents of standardization institutions ITUEFTSI IFFE and others. □ Scientific papers in the area of wireless and mobile									
	communication netw	ommunication networ								
Screening student	Class attendance	1.0	Posoarc	•h	_	Practical tr	aining	_		
work (name the		1,0	Researc	/11	_		anning			
proportion of ECTS	Experimental work	-	Report		-	Individual v	vork	1,7		
credits for each			Semina	-						
activity so that the	Essay	-	essav		-	Laboratory	exercises	, 0,5		
total number of						Preparation	n for			
ECTS credits is	lests	0,2	Oral exa	ım	-	laboratory	exercises	0,5		
equal to the ECIS	Written exam	0.1	Project		_	(Oth	or)			
value of the course)		0,1	Tiojeet			(01				
	There are two midte	rms and	d final exa	ms. Th	e first m	nidterm exar	n is after	7 weeks of		
	lecturing and the sec	cond on	ie is after	the nex	xt 6 wee	eks. Each m	lidterm an	d final test		
	consists of 10 theory	etical qu		ana nur	nerical	propiems. I	ne duratio	on of each		
	test is 2 school nour.	In the f	inal exam	s stude	nts that	did not pass	s the midte	exams		
	requirement for pose	ienn ar	lu inai e de ie the r			neu out as	s written	reises the		
	sominar exercise ar	any yiat	nointe c	n oach	midtor		the final of	Tuses, the		
Grading and	continuous knowled		sement a	rade (in	nercen	in exam or	ned accor	ding to the		
evaluating student	formula:	je 235e	Someric g		percer	lage/ is form		ung to the		
work in class and at	Gr	ade(%)	= 0.05 N	P + 0.1	5 LV +	0.4 (M1 + M	2)			
the final exam	the activities in perce	entage:	-,	,-		-, - (	_/			
	<ul> <li>NP – attend</li> </ul>	ance at	lectures.							
	<ul> <li>LV – laborat</li> </ul>	ory ass	essment.							
	<ul> <li>M1. M2 – tes</li> </ul>	st result	ts.							
	,									
	The final grade is ba	sed on t	the grade	of the c	continuc	us knowled	ge assesn	nent grade		
	and the oral part of th	ne final o	exam. Th	e stude	nts who	se grade ma	ay be form	ed without		

	he need for the oral part of the final exam may not be obliged to attend the oral part of the exam. There are two terms for the final exam and one additional term for the make up exam. The requirement for attendance of the final exam or the make up exam is the passing grade for all laboratory excercises and submitted seminar excercis work. At the final exam the student writes the test from the area of the miterm exam(s) which has/have not been succesfully passed before. At the make up exam the student writes the test rom the complete course.								
Required literature (available in the	Title	Number of copies in the library	Availability via other media						
media)	D.Begušić: Mobile communication networks, handouts, FESB, 2016.		e-learning portal						
Optional literature (at the time of submission of study programme proposal)	<ul> <li>P.M.Shankar: Introduction to Wireless Systems, John Wiley ✓ sons, USA, 2002 -</li> <li>Documents of standardization institutions ITU, ETSI, IEEE and others.</li> </ul>								
Quality assurance methods that ensure the acquisition of exit competences	<ul> <li>Evaluation of results in accordance with the above learning outcomes</li> <li>Feedback from students via surveys</li> <li>Self-evaluation of teachers</li> <li>Institutional and non-institutional evaluations</li> </ul>								
Other (as the proposer wishes to add)									
NAME OF THE COURSE	MULTIMEDIA								
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Code	FELO19	Year of study	2.						
Course teacher	PhD Mladen Russo Associate professor	Credits (ECTS)	(ECTS) 5						
Associate teachers	mag. ing. Matija Pauković, Assistant mag. ing. Jelena Čulić- Gambiroža mag. ing. Martina Bašić	Type of instruction (number of hours)	L 30	S 0	AE 0	LE 30	DE 0		
Status of the course	Obligatory	Percentage of application of e-learning	0						
	COURSE	DESCRIPTION							
Course objectives	Course objectives Training students for: - understanding of multimedia systems and virtual reality - knowledge of the properties and methods for generating speech, audio, image and video signals (including 3D images and video) - understanding of the most important algorithms for compressing speech,								
Course enrolment requirements and entry competences required for the course	None.								
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<ul> <li>describe the basic principles of human speech, hearing and vision</li> <li>understand the mechanisms and standards in image, audio and video compression</li> <li>explain the basic principles of psychoacoustics and their application in compression of audio signals</li> <li>apply the basic mechanisms of audio signal processing</li> <li>understand and demonstrate the use of basic elements of JPEG standard</li> <li>use the system for course management and information exchange</li> <li>differentiate the basic image features and principles in image editing</li> </ul>								
	Course content				or S	/ hc	AE burs		
	Introduction. History of mul Overview of multimedia so applications.	l	2		0				
	Audio signal. How humans modelling.		2		0				
	Generic compression techr specific algorithms (mp3).		2		0				
Course content broken down in detail by weekly	Speech specific algorithms and applications in mobile encoding speech and audio	(LPC, CELP, RELP, MPE telephony. Review of stan o signals.	E, RPE) dards fo	or	2		0		
class schedule (syllabus)	Color in images and video people perceive electromatic colors.	signal. The perception of o gnetic radiation). Theory o	color (ho f mixing	w I	2		0		
	Color models for image sig models for video signal (YU color models (HSB, HLS, H signal (resolution, depth, m formats (gif, tiff, jfif, ps, bm	nal (RGB, CMY, CMYK). ( JV, YIQ, YCbCr). Software ISV). Gamma correction. I nemory requirements). Ima p).	Color e-oriente mage age	ed	2		0		
	Basics of video and televis Digital television and video requirements.	ion. Analog television and . Video formats and memo	video. ory		2		0		

	Image compression.	JPEG I	nodes.				2	0	
	Video compression: H.261. H.263. 2							0	
	Video compression: MPEG-1. MPEG -2.							0	
	Video compression: MPEG-4.						2	0	
	Video compression:	Video compression: H.264.						0	
	Fundamentals of virt	Fundamentals of virtual reality. History. Stereoscopic (3D)						0	
	vision. Software and	hardwa	are for vir	ual rea	lity.				
	Introduction in Moodl	oduction in Moodle system and content definition							
	The use of Prezi tool							2	
	Introduction into the a	audio pr	ocessing					2	
	Pitch period - assess	ment of	human b	asic sp	eech fre	equency		2	
	Psychoacoustics - as	sessme	ent of the	human	audibilit	ty treshold a	and	2	
	frequency masking							Z	
	Realization of the bas	sic elerr	ents of J	PEG sta	andard			2	
	Application of the JP	EG stan	idard in th	ne imag	je comp	ression		2	
	Color models, conve	rsion an	d color g	amut as	ssessme	ent		2	
	Raster graphics editi	ng using	g the GIN	P softw	/are			2	
	Introduction into the	orogram	iming for	Androic	d operati	ing system		2	
				🗆 inde	ependen	t assignme	nts		
	$\square$ seminars and wo	rkshops		🗆 mul	timedia	<b>J</b>			
Format of instruction				🛛 labo	oratory				
	$\square$ on line in entirety			$\Box$ wor	k with m	entor			
					(othe	er)			
Student	The presence on lec	tures in	the amo	int of a	t least 7	0 % of the t	imes sche	aduled	
responsibilities	Performed all require	ed labor	atory exe	rcises.	100017			Jaaloa.	
Screening student	Class attendance	3	Researc	h		Practical tra	Practical training		
proportion of ECTS	Experimental work		Report			Individual work		1,7	
credits for each activity so that the	Essay		Semina essay			(Oth	ner)		
ECTS credits is	Tests	0,2	Oral exa	ım		(Oth	ner)		
equal to the ECTS value of the course)	Written exam	0,1	Project			(Oth	ner)		
Grading and evaluating student work in class and at the final exam	During a semester there are two midterms and final exam. Final exam and midterms are held according to the calendar of classes. At the final exam students take the test from the complete course if they do not have a positive grade on the midterms of take the midterm that they did not pass. At the make-up and commission exam students take the test from the complete course. The requirement for passing grade is 50% points on each midterm exam or the final exam. Grade (in percentage) is formed according to the formula: Grade(%) = 0,5*M1+0,5*M2; M1, M2 – midterm test results. The final grade is determined as follows: Percentage Grade 50% to 61% sufficient (2) 62% to 74% good (3) 75% to 87% very good (4) 88% to 100% excellent (5)						I midterms ke the test idterms or sion exam or the final		

Required literature (available in the	Title	Number of copies in the library	Availability via other media			
media)	H. Dujmić: Multimedijski sustavi, internal script	1	e-learning portal			
Optional literature (at the time of submission of study programme proposal)	teinmetz, Nahrstedt: "Multimedia Fundamentals: Media Coding and Content rocessing", Prentice Hall, 2002 ao, Bojkovic, Milovanovic: "Multimedia Communication Systems: Techniques, atandards and Networks", Prentice Hall, 2002					
Quality assurance methods that ensure the acquisition of exit competences Other (as the proposer wishes to add)	Evaluation of results in accordance with the above learning outcomes Feedback from students via surveys Self-evaluation of teachers Institutional and non-institutional evaluations					

NAME OF THE COURSE	OPTICAL COMMUNICATIONS									
Code	FELO45	Year of study	3.							
Course teacher	Dinko Begušić, Ph.D., Full Professor	Credits (ECTS)	4							
	Maja Stella, Ph.D., Assistant Professor	Turne of instruction	L	S	AE	LE	DE			
Associate teachers	lvica Meštrović, dipl. ing. Marko Banović, dipl. ing. Josip Babić, Mag. Ing,.	(number of hours)	30	0	-	15	0			
Status of the course	Obligatory	Percentage of application of e-learning								
	COURSE	E DESCRIPTION								
	Training students for: - understanding and applic communication 184/ystem	ation of basic concepts an	d techno	ologie	s of o	otical				
Course objectives	- application of passive and	d active components of op	tical sys	tems	and n	etwork	(S,			
	systems and networks,	- collaborate in design, development and maintenance of optical communication systems and networks,								
-	communication systems a	and networks.	ye in the		or op	licai				
Course enrolment requirements and entry competences required for the course	None									
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<ul> <li>Students will be able to:</li> <li>define the basic concepts using optical communicat</li> <li>identify the characteristic systems and networks,</li> <li>identify the characteristic networks,</li> <li>collaborate in design, de systems and networks,</li> <li>permanently adopti and de systems and networks.</li> </ul>	s and methods for signal p ion systems, cs and apply passive and cs and apply the technolo evelopment and maintena eepen the knowledge in the	processi active ogies of ance of e area of	ing ar comp optica optica f optic	nd con ponent al con al con al con	nmunio s of c nmunio nmunio	cation optical cation cation cation			
	Course content			L	or S	/ hc	∖E ours			
	Signal transmission and pr Optical fibre characteristics	ocessing using photonic s 3.	ystems.		2		-			
	Analysis of linear time inva	riant systems.			2		-			
Course content	Splicing of the optical fibers cables.	s. Optical connectors. Opti	cal		2		-			
broken down in	Linear and nonlinear effect	s. Soliton systems.			2		-			
detail by weekly class schedule (syllabus)	Passive element sin optica Directional couplers, isolate multiplexers.	l communication systems. ors, circulators, optical filte	ers,		2		-			
	Bragg grating, Mach-Zende	er interferometer, Fabry-Pe	erot filte	r. 🗌	2		-			
	Active components in optic amplifiers. EDFA amplifiers	al communication network	s. Optic	al	2		-			
	Light sources. Light emittin	diodes (LED). Laser diod	es (LD).		2		-			
	Photonic detectors. Pin photonic (APD).	otodiodes. Avalanche phot	odiodes	5	2		-			

	Photonic switches. Modulators and demodulators. 2							-	
	Characteristics of op	iysical	2	-					
	Systems with time d	domain	2	-					
	Multiplexing (WDM,	Optical networks SDH/SONET, Optical laver, Access networ							
	based on optical tec networks (PON).	hnologie	es: FTTx	system	s. Pass	sive optical	2	-	
	List of laboratory or	ist of laboratory or design exercises							
	Fiber optic and cable	er optic and cables.							
	Power measurement	s in fibe	r optic sy	stems.				2	
	Optical splicing. Optical connectors a	nd splitt	ers					2	
	Measurements on W	DM sys	tems.					2	
	Measurements by op	tical ref	lectomete	er.				2	
	Measurements on PO	ON netw	vorks.					2	
	☑ lectures			□ inde	nender	it assignme	nts		
	seminars and wor	kshops			imedia	it assignmen	11.5		
Format of instruction	⊠ exercises			⊠ labo	ratory				
	$\Box$ on line in entirety				with m	entor			
	□ partial e-learning (other)								
	☐ field work	field work							
Student responsibilities									
Screening student	Class attendance	1,0	Researc	h	-	Practical tra	ractical training		
proportion of ECTS	Experimental work	-	Report		-	Individual v	2,0		
activity so that the	Essay	-	Seminal	-	-	Laboratory	aboratory exercises		
ECTS credits is	Tests	0,2	Oral exa	am	-	Preparation for laboratory exercises		0,2	
value of the course)	Written exam	0,1	Project		-	(Oth	ner)		
Grading and evaluating student work in class and at the final exam	There are two midte lecturing and the sec consists of 10 theore test is 2 school hour. take part. The mid requirement for pass seminar exercise ar continuous knowledg formula: If the activities in perce NP – attend LV – laborat M1, M2 – te The final grade is ba and the oral part of th the need for the oral of the exam. There are two terms The requirement for grade for all laborato exam the student wr	Vritten exam       0,1       Project       -       (Other)         here are two midterms and final exams. The first midterm exam is after 7 weeks of acturing and the second one is after the next 6 weeks. Each midterm and final test onsists of 10 theoretical questions and numerical problems. The duration of each est is 2 school hour. In the final exams students that did not pass the midterm exams ake part. The midterm and final exams are carried out as written tests. The equirement for passing grade is the positive assessment of laboratory exercises, the eminar exercise and 50 % points on each midterm exam or the final exam. The ontinuous knowledge assessment grade (in percentage) is formed according to the ormula:         Grade(%) = 0,05 NP + 0,15 LV + 0,4 (M1 + M2)         ne activities in percentage:         NP – attendance at lectures,         LV – laboratory assessment,         M1, M2 – test results.         The final grade is based on the grade of the continuous knowledge assessment grade nd the oral part of the final exam. The students whose grade may be formed without the need for the oral part of the final exam may not be obliged to attend tthe oral part of the final exam. The students whose grade may be formed without the need for the oral part of the final exam and one additional term for the make up exam.							

	not been succesfully passed before. At the make up e from the complete course.	exam the stude	ent writes the test			
Required literature (available in the library and via other	Title	Number of copies in the library	Availability via other media			
media)	D.Begušić: Optical communicatios, handouts, FESB, 2016.		e-learning portal			
Optional literature (at the time of submission of study programme proposal)	Rajiv Ramaswami, Kumar Sivarajan: "Optical Networks: A Practical Perspective", (Second edition), Academic Press, 2002. Documents of standardization institutions ITU, ETSI, IEEE and others,					
Quality assurance methods that ensure the acquisition of exit competences	<ul> <li>Evaluation of results in accordance with the above learning outcomes</li> <li>Feedback from students via surveys</li> <li>Self-evaluation of teachers</li> <li>Institutional and non-institutional evaluations</li> </ul>					
Other (as the proposer wishes to add)						

NAME OF THE COURSE	BASICS OF OPTOELECTRONICS								
Code	FELO07	Year of study							
Course teacher	Tihomir Betti, Ph.D., Assistant Professor	Credits (ECTS)	4						
Associate teachers		Type of instruction (number of hours)	L 30	S	AE	LE 15	DE		
Status of the course	Obligatory	Percentage of application of e-learning		-					
	COURSE	E DESCRIPTION							
Course objectives	<ul> <li>Training students for:</li> <li>Understanding physical principles of operation of the most important optoelectronic devices.</li> <li>Application of optoelectronic devices in circuits for light sourcing and/or detection.</li> </ul>								
Course enrolment requirements and entry competences required for the course	None.	Jone.							
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<ul> <li>Students will be able to:</li> <li>Explain the basic parameters of semiconductor materials important for optoelectronic applications.</li> <li>Describe the basic physical processes related to interaction of semiconductors with light.</li> <li>Explain the operation of light-emitting diode and test its operation in the laboratory.</li> <li>Name the commonly used photodetectors, test them in the laboratory and compare their properties.</li> <li>Measure the I-V curve of the photovoltaic module and calculate its efficiency and fill factor.</li> </ul>								
	Course content					Lh	ours		
	Introduction to optoelectror	nics.					2		
	Semiconductor materials. E Transport mechanisms in s	Electrons and holes in sem semiconductors (diffusion a	nicondu and dri	uctors. ft).			2		
	Carrier densities in semiconductors. Electrical conductivity of semiconductor.						2		
	Fermi level in semiconductors. Quasi-Fermi levels. Direct and indirect						2		
Course content	Semiconductor heterostruc semiconductor heterostruc well.	tures. Semiconductor allog tures and strained-layer ep	ys. Lat oitaxy.	tice-ma Quant	atched um		2		
broken down in	Interaction of photons with absorption. Probabilities of	carriers in semiconductors absorption and emission.	s: emis	sion ai	nd		2		
class schedule	Optical joint density of state Theoretical spontaneous e	es. Rates of absorption an mission spectrum.	d emis	sion.			2		
(Syliabus)	Light-emitting diode: opera characteristics, materials a	ting principle, basic param	eters.	Device	;		2		
	Operating principle of a las	er. Laser types. Laser dio	des.				2		
	Classification of photodeter quantum efficiency, respon	ctors. Main parameters of sivity, impulse response, of	a photo dark cu	odetec ırrent.	tor:		2		
	Photoconductors: operating print	g principle, main properties	s and a	applica	tions.		2		
	P-N and P-I-N photodiodes circuits. Phototransistors.	s. Avalanche photodiodes.	Basic	photoc	liode		2		
	Solar cells: operating princ technology, applications.	iples, main parameters, I-	√ curve	e. Mate	rials,		2		

	List of laboratory or	design e	exercises				L	E hours	
	Light-emitting diodes	ght-emitting diodes. 3							
	'hotoconductor.							3	
	Photodiode.	notodiode.							
	Phototransistor. Opto	coupiei	•					3	
								3	
		kahana		□ indep	endent	assignments			
		ksnops		🗵 multin	nedia				
Format of instruction				⊠ labora	atory				
				□ work	with me	entor			
					(othe	r)			
Student									
responsibilities	At least 70% of lectu	ires atte	ndance.	Complete	ed all la	boratory assig	nments		
Screening student work (name the	Class attendance	1	Researc	h		Practical trainir	ng		
proportion of ECTS	Experimental work		Report			Individual work		2	
activity so that the	Essay		Seminar essay			Laboratory exe	rcises	0.5	
ECTS credits is	Tests	0.15	Oral exa	ım		Preparation for laboratory exer	cises	0.25	
value of the course)	Written exam	0.1	Project			(Other)			
Grading and evaluating student work in class and at the final exam	after 7 weeks of cla midterm exam is w problems. To pass a positive assesment of The final grade (in p where: • M1, M2 – gr • L – grade fro Students not passin the final exam, stu assesment of the lat the formula: where: • T – grade fro	after 7 weeks of classes and the second one after the following 6 weeks. Each midterm exam is written and consists of theoretical questions and numerical problems. To pass an exam, the student should score at least 50% and also have a positive assessment of the laboratory exercises. The final grade (in percentage) is determined according to the formula: Grade(%)=0.35(M1+M2)+0.3L, where: • M1, M2 – grade from midterm exams given in percentage, • L – grade from laboratory exercises given in percentage. Students not passing the midterm exams take part in the final exams. For passing the final exam, students must score at least 50% as well as have a positive assessment of the laboratory exercises. The grade on final exams is determined by the formula: Grade(%) = 0.7F+0.3L, where: T = made from 5 final exams prove the proventions.							
		<b>T</b> '41				Number of	Availal	oility via	
		litie	<del>)</del>			copies in	other	media	
Required literature	T. Betti: Optoelektronika – autorizirana predavanja					the library	E-lea	arning	
(available in the	I. Zulim, S. Gotovac:	Osnov	ni poluvo	dički			p c		
media)	elektronički elementi	i, FESB	, Split, 19	98.					
modia	S.O. Kasap: Optoele	ectronics	s and Pho	otonics,					
	Pearson, 2013.		inter Ont						
	P. Dhallacharya. Se Devices Prentice H	all 1997		Delection	IC				
Ontional literature	- B.E.A. Saleh, M	.C. Teic	h: Funda	mentals o	of Phot	onics, 2nd editi	ion, Wile	ey,	
(at the time of	2007.			-4	ы			0.14	
submission of study	J. Singn: Semico	unducto	r Optoele	ctronics:	Physic	s and Lechnol	ogy, Mc	Graw-	
programme	ETIII. 1990.		<ul> <li>J. Singh: Semiconductor Optoelectronics: Physics and Technology, McGraw- Hill, 1995.</li> </ul>						
	- SI Chang Ph	Hill, 1995. S. L. Chang, Physics of Optoelectronic Devices, Wiley, 1995							
proposal)	<ul> <li>S. L. Chang, Ph</li> <li>P. Horowitz, W.</li> </ul>	ysics of Hill: The	Optoelec Art of E	tronic De	evices, s, Caml	Wiley, 1995. bridge Universi	ty Press	s, 2015.	

Quality assurance methods that ensure the acquisition of exit competences	<ul> <li>Record of number of students attending the classes</li> <li>Evaluation of results in accordance with expected learning outcomes</li> <li>Feedback from students via student surveys</li> <li>Teachers self-evaluation</li> <li>Institutional and non-institutional evaluations</li> </ul>
Other (as the proposer wishes to add)	

NAME OF THE COURSE	PHYSICS							
Code	FEMO01	Year of study	1					
Course teacher	lvica Sorić, senior lecturer	Credits (ECTS)	5					
	,	()	<u> </u>	c			БЕ	
Associate teachers		Type of instruction	L	3	AE	LE	DE	
		(number of hours)	30		15	15		
Status of the course	Obligatory	Percentage of application of e-learning						
	COURSE	DESCRIPTION	•					
	Training students for:							
Course objectives	understanding and application of basic principles and classical physics, setting up and solving simple physical problems, permanent deepening of knowledge as a necessary basis for adoption of further professional skills							
Course enrolment								
requirements and								
entry competences	None							
required for the								
course	Students will be able to:							
Learning outcomes	- define the fundamental	phenomena the quantitie	es and t	he la	ws of n	hysics		
expected at the level	- apply fundamental law	s for the calculation of phy	sical qu	antiti	es	riyoloc	,	
of the course (4 to	- mathematically formula	apply runuamental laws for the calculation of physical quantities, mathematically formulate and analyse simple physical problems describing						
10 learning	observable natural phenomena,							
outcomes)	- measure basic physical quantities (velocity, acceleration, force, torque).							
	Course content						١E	
					hours	hc	ours	
	About physics. Physical q	uantities. International sys	tem of		2		1	
	Units (SI). Scalar and vect	ors. Derivations and integ	rais.					
	or three dimensions Circl	lar motion Centrinetal an	d	wo	2		1	
	tangential acceleration		u		2		'	
	Particle dynamics. Newton	n laws of motion. Linear m	omentu	m	•			
	and impulse of force. Frict	tion.			2		1	
	System of particles kinem	atics and dynamics. Cente	er of		2		1	
	mass. Conservation of line	ear momentum.			2		1	
	Work, energy. Conservati	ve and unconservative for	ces.		0			
	Potential and kinetic energy	gy. Conservation of mecha	anical		2		1	
Course content	Solid body mechanics To	raue Momentum of inertic	n					
broken down in	Rotation around a fixed a	kes. Conservation of angu	lar		2		1	
detail by weekly	momentum.							
(syllabus)	Inertial and uninertial fram	es. Forces in the uninertia	l frame	s. 🗌	2		1	
(oynabao)	Gravitation force. Gravitat	ion field.			-			
	Fluid mechanics. Fluid sta	atics. Pascal s principle, Al	cnimed	es	2		1	
	Fluids dynamics Equation	and capillanty.	equatio	n	2		1	
	Oscillations, Harmonic os	cillations. Damped and for	ced		~			
	oscillations. Mathematical	and physical pendulum.			2		1	
	Resonance.							
	Mechanical waves. Equat	ion of traveling wave. Sou	nd wave	es.	2		1	
	Superposition of waves. In	nterferention. Standing wa	ves.					
	Heat and temperature. En	npirical gas laws. Ideal gas	s law.		2		1	
	I NE KINETIC THEORY OF GASE	s. FIRST IAW OF THERMODYNA	INICS.		2		1	
		amito.				IF	or DF	
	List of laboratory or design	exercises				hc	ours	

	Measuring of length	Aeasuring of length. Measuring of gravitation constant.						
	Measuring of friction	Measuring of friction coefficient. Measuring of inertion momentum.						
	Measuring of solid d	ensity. I	Measurin	g of liqu	iid dens	ity.		1
	Ventouri`s tube – tes	sting of	Bernoulli	s equat	tion.			1
	Mathematical and pl	nysical p	pendelum	ı. Airy`s	pendel	um.		1
	Measurement of souvelocity in the metal.	easurement of sound velocity in the air. Measurement of sound ocity in the metal.						
	Specific heat capaci	tance m	easurem	ent. Em	npiric ga	s laws testing.		1
	Geometrical optics.	Lens. S	pherical r	nirror.				1
	☑ lectures			□inde	nondon	t assignments		
	seminars and wor	seminars and workshops						
Format of instruction	⊠ exercises	exercises						
	□ on line in entirety				vialory	ontor		
	partial e-learning     (other							
	□ field work				(othe	;;;)		
Student								
responsibilities			1					
Screening student work (name the	Class attendance	1	Researc	:h		Practical training	ng	
proportion of ECTS credits for each	Experimental work		Report			Laboratory exe	ercises	0,5
activity so that the total number of	Essay		Seminal essay	-		(Other)		
ECTS credits is	Tests	0,5	Oral exa	am	2	(Other)		
value of the course)	Written exam	1	Project			(Other)		
Grading and evaluating student work in class and at the final exam	lecturing and the se of 8 theoretical que theoretical questions not pass the midtern as written tests. The laboratory exercises (in percentage) is fo the activities in perce • LV – laborat • M1 – test re • M2 – test re Final grade would be	<ul> <li>Include two inductions and a materixitation. The instrimutation oxam is after 1 weeks of lecturing and the second one is after the next 6 weeks. Each midterm test consists of 8 theoretical questions and 4 numerical problems and final tests consist of 16 theoretical questions and 8 numerical problems. In the final exams students that did not pass the midterm exams take part. The midterm and final exams are carried out as written tests. The requirement for passing grade is the positive assessment of laboratory exercises and 45 % points on each midterm exam or the final exam. Grade (in percentage) is formed according to the formula:</li> <li>Grade(%) = 0,25 LV + 0,5 M1 + 0,25 M2</li> <li>the activities in percentage:</li> <li>LV – laboratory assessment,</li> <li>M1 – test results (theoretical problems)</li> <li>M2 – test results (numerical problems)</li> <li>Final grade would be determined from the relative evaluation rules.</li> </ul>						
						Number of	Availab	ilitv via
		Title	•			copies in	other	media
		1. 4 P	Ŏ.			the library		
	P. Kulisic: Menanika	i topiina	a, Skoisk	a knjiga	,			
	V Henč-Bartolić P	Kulišić	Valovi i c	ntika Š	koleka			
Required literature	kniiga Zagreb 2004	l l	Valovi i C	puna, c	Noiska			
(available in the	M.Grbac: Predavani	knjiga, Zagreb, 2004.						
library and via other	M.Grbac: Predavanja iz fizike						e-lea	rning
media)	M. Grbac: Zadaci iz	fizike, 2	e 008.				e-lea e-lea	rning rning
M. Grbac I L. Rađa-Ljubić: Zadaci iz fizike							e-lea e-lea	rning rning
	M. Grbac: Zadaci iz M. Grbac i L. Rađa-I (mehanika i hidrome	a iz fizik fizike, 2 _jubić: Z hanika)	ie 008. Zadaci iz 1 , FESB, S	fizike Split, 19	91.		e-lea e-lea	rning rning
	M. Grbac: Zadaci iz M. Grbac i L. Rađa-I (mehanika i hidrome S. Botrić, N. Godino Laboratorijske vježb	a iz fizike, 2 _jubić: Z ⊵hanika) vić, M. 0 e iz Fizi	ie 008. Zadaci iz 1 , FESB, S Grbac, I. I ke, 2006.	fizike Split, 19 Puljak, I	91. . Sorić:		e-lea e-lea e-lea	rning rning rning
	M. Grbac: Zadaci iz M. Grbac i L. Rađa-I (mehanika i hidrome S. Botrić, N. Godino Laboratorijske vježb I. Sorić, Predavanja	a iz fizike, 2 ₋jubić: Z hanika) vić, M. ( e iz Fizi iz Fizike	e 008. 2adaci iz 1 , FESB, \$ Grbac, I. I ke, 2006. e.	<sup>fi</sup> zike Split, 19 Puljak, I	91. . Sorić:		e-lea e-lea e-lea e-lea	rning rning rning rning

Optional literature (at the time of submission of study programme proposal)	N. Cindro: Fizika I, Školska knjiga, Zagreb, 1991. N. Cindro: Fizika II, Školska knjiga, Zagreb, 1985.
Quality assurance methods that ensure the acquisition of exit competences	<ul> <li>Evaluation of results in accordance with the above learning outcomes</li> <li>Feedback from students via surveys</li> <li>Self-evaluation of teachers</li> <li>Institutional and non-institutional evaluations</li> </ul>
Other (as the proposer wishes to add)	

NAME OF THE COURSE	POWER ELECTRONICS	POWER ELECTRONICS								
Code	FENO07	Year of study	2							
Course teacher	Dinko Vukadinović, Ph.D., Full Professor	Credits (ECTS)	6							
Associate teachers	Mateo Bašić, Ph.D. Assistant Professor Ivan Groić, Assistant	Type of instruction (number of hours)	L 45	S 0	AE 0	LE 30	DE 0			
Status of the course	Obligatory	Percentage of application of e-learning	0			<u> </u>				
COURSE DESCRIPTION										
Course objectives	Training students for: - understanding of basic pr - understanding of power c - analysis of rectifiers, inve	inciples of power electronic onverters operating princip rters and non-isolated DC-	cs devi bles DC co	ces sv nverte	vitching rs	I,				
Course enrolment requirements and entry competences required for the course	None	ne								
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<ol> <li>define ways of power ele</li> <li>explain the natural comr</li> <li>193nalyse the operation</li> <li>adjust the firing angle of</li> <li>mean value of the output v</li> <li>make the simulation mod</li> <li>make the simulation mod</li> <li>operate with the buck not</li> <li>calculate the power factor</li> <li>calculate the thermal res</li> <li>specify ways of power</li> </ol>	<ul> <li>) define ways of power electronics devices switching</li> <li>) explain the natural commutation in phase-controlled rectifiers</li> <li>) 193nalyse the operation of rectifiers, inverters and non-isolated DC-DC converters</li> <li>) adjust the firing angle of full-controlled bridge converter in accordance the desired nean value of the output voltage</li> <li>i) make the simulation model of the phase-controlled three-phase converter</li> <li>i) make the simulation model of the buck non-isolated DC-DC converter</li> <li>i) operate with the buck non-isolated DC-DC converter</li> <li>i) calculate the power factor of the load connected to the electric grid via the power converter</li> <li>i) calculate the thermal resistance of certain power electronics device</li> </ul>								
	Course content				L					
	Introduction and basic prin	ciples of power electronics	device	s	4					
	Ways of power electronics commutation	devices turning-off and na	tural	_	4					
	Diode rectifiers				4					
	Comparison of the diode re	ectifiers			2					
	Thyristor-based converters	i			4					
Course content	Power flow in electric grids and effects of current disto	with power electronics con rtion	nverter	s	4					
detail by weekly	AC converters				3					
class schedule	Inverters				4					
(syllabus)	Non-isolated DC-DC conve	erters			5					
	Direct AC-AC converters				4					
	Heat transfer in power elected electronics devices protect	tronics devices and power ion			3					
	List of laboratory exercises					h	LE ours			
	Resistor and inductor with a	a power electronics device	(simula	ation)			3			
	Natural commutation (simul	ation)		,			3			
	Single-phase full-controlled (simulation)	bridge converter for the D	C moto	or supp	oly		6			

	Three-phase full-cont	rolled b	ridge cor	nverter (sim	ulatio	n and experim	nents)	6
	Single-phase AC volt	Single-phase AC voltage controller (experiments)						
	Single-phase AC volt	age con	troller (s	imulation a	nd exp	periments)		6
Format of instruction	<ul> <li>× lectures</li> <li>□ seminars and worl</li> <li>⊠ exercises</li> <li>□ on line in entirety</li> <li>□ partial e-learning</li> <li>□ field work</li> </ul>	kshops		<ul> <li>x independent assignments</li> <li>⊠ multimedia</li> <li>x laboratory</li> <li>□ work with mentor</li> <li>□ (other)</li> </ul>				
Student		tures in	the amo	unt of at lea	net 70	% of the time	s schedu	led
responsibilities	Performed all require	ed labora	atory exe	ercises.	13170		S SCHEUU	ieu.
Screening student work (name the	Class attendance	1	Resear	ch		Practical trai	ining	
proportion of ECTS credits for each	Experimental work		Report			Individual wo	ork	3
activity so that the	Essay		Semina	r essay		Laboratory e	exercises	1
ECTS credits is	Midterm exams	0.3	Oral exa	Oral exam		Auditory exe	ercises	0.5
equal to the ECTS value of the course)	Written exam	0.2	Project			(Other)		
Grading and evaluating student work in class and at the final exam	During the semester, and the second after either theoretical or course which they did The requirement for (L) and the midterm more. The sum is cal Grade (%) = 0.25 where the number of The students that do consists of 4 problem at least 50% points a the midterm exams a course. Subsequentl Grade (%) = 0.2 where I is the number The final grade for th 50% to 61% - Suffici 62% to 74% - Good 75% to 87% - Very g 88% 100% - Exceller	, two mi 13 weel numeric d not pa s' grade lculated 5L + 0.3 points a points a points a o not pa ns. The achieved are pres y, the gr 5L + 0.7 er of poir e cours ient (2) (3) good (4) <u>ht (5)</u>	dterm ex ks of lect cal. In the ss in the grade is es (M1 a as 75(M1 + achieved ss the m requiren d. In the ented wi rade is d 75(I) hts achie e is dete	ams are he ures. Each e final exa midterm e s that the s nd M2), ex M2) in each mi nidterm exa nent for a p final exam, th 4 proble etermined as ved in the f	eld – til midter ms, s xams. um of cpress dterm ms ta ositive the st ms fro as follo inal w ollows	the laborator ed as a percent exam has to ke the final we evaluation of tudents that d m the correspons: ritten exam (a	' weeks of sists of 4 p those pa y exercis entage, i be at lea vritten exa of the fina bonding p at least 50	f lectures problems, rts of the es' grade s 50% or st 50%. am which l exam is ss one of part of the 0%).
Required literature (available in the library and via other		Title	!			Number of copies in the library	Availat other	oility via media
media)	D. Vukadinović, Lj. K energetske elektronil	ulišić: P ke za šk	redavan god. 20	ja iz )13/14			e-learni	ng portal
	D. W. Hart: Power El	ectronic	s, McGr	aw-Hill, 201	1.		e-learni	ng portal
Optional literature (at the time of submission of study	N. Mohan, T. N. Und Applications, and De	eland, T sign, 3n	. N. Rob d Editior	bins, Powe n, John Wile	er Elec ey	tronics: Conv Sons, 2003.	erters,	

programme proposal)	
Quality assurance methods that ensure the acquisition of exit competences	<ul> <li>Keeping records of student attendance</li> <li>Annual analysis of the performance at midterm exams and final exams</li> <li>Feedback from students via surveys</li> <li>Self-evaluation of teachers</li> <li>Feedback from graduated students</li> </ul>
Other (as the proposer wishes to add)	

NAME OF THE COURSE	POWER SYSTEM AND E	NVIRONMENT							
Code	FENO22	Year of study	3.						
Course teacher	Tonći Modrić, Ph.D., Assistant Professor Mate Dabro, Ph.D., Assistant Professor	Credits (ECTS)	5						
Associate teachers		Type of instruction (number of hours)LSAEL30003							
Status of the course	Elective	Percentage of application of e-learning	0						
	COURSE	E DESCRIPTION							
Course objectives	<ul> <li>Training students for under</li> <li>characteristics of the p</li> <li>various aspects of the environment,</li> <li>environmental protection</li> </ul>	raining students for understanding and application specialized knowledge of: characteristics of the power system in the Republic of Croatia, various aspects of the impact of electric power facilities, plants and lines on the environment, environment,							
Course enrolment requirements and entry competences required for the course	None								
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<ul> <li>Students will be able to:</li> <li>describe the characteri</li> <li>describe the various as and lines on the enviro</li> <li>specify the reference le</li> <li>measure the power fre</li> <li>explain the principle of</li> <li>explain the principle of potential,</li> <li>measure resistivity of s geoelectric sounding d</li> <li>describe the protective facilities, plants and lin</li> <li>explain the occurrence protection against elec</li> <li>explain the basic princi the environment of elege</li> </ul>	<ul> <li>Students will be able to:</li> <li>describe the characteristics of the power system in the Republic of Croatia,</li> <li>describe the various aspects of the impact of electric power facilities, plants and lines on the environment,</li> <li>specify the reference levels of power frequency electric and magnetic fields,</li> <li>measure the power frequency magnetic flux density and electric field intensity,</li> <li>explain the principle of measuring ground resistance of the grounding system,</li> <li>explain the principle of measuring touch voltage, step voltage and transferred potential,</li> <li>measure resistivity of soil and explain the principle of interpretation of geoelectric sounding data,</li> <li>describe the protective measures against harmful effects of electric power facilities, plants and lines on the environment,</li> <li>explain the occurrence of electrical corrosion and the basic principles of protection against electrical corrosion,</li> <li>explain the basic principles of fire protection and noise levels measurements in</li> </ul>							
	Course content	· · · ·			hc	L ours			
	Power system in the Reput	blic of Croatia.				2			
	Electricity generation.					4			
	Electric power transmission	n and distribution.				4			
Course content	Calculation of power frogue	II. anov electromagnetic field:	s of nower li	105		۷			
broken down in	and plants.	ency electromagnetic neid:		162		4			
detail by weekly class schedule (syllabus)	Measurement of power free and plants. Prescribed refe magnetic fields.	quency electromagnetic fie erence levels of power freq	elds of powe uency elect	r lines ic and		2			
	The impact of the power sy	stem on the environment.				4			
	Fire and noise protection.		• · ·			2			
	Satety requirements inside	and outside the electric p	ower plants.			2			
	Calculation of nower freque	nov magnetic flux density				iours 3			
	Measurement of power freque	quency magnetic flux density.	ty.			3			
			· .		-	-			

	Calculation of power	frequen	icy electri	c field intensity			3
	Measurement of power frequency electric field intensity.						
	Geoelectric sounding	J.					3
	Interpretation of geoe	electric s	sounding	data.			3
	Ground resistance m	easurer	nent of a	small groundin	ig system.		3
	Checking the system	of the f	ire protec	tion.	worplant		3
			IVIIOIIIIe		wei plant.		3
		rkehone		🛛 independer	nt assignments		
		rsnops		multimedia			
Format of instruction	$\Box$ exercises			☑ laboratory			
	□ partial e-learning			nentor			
				□ (other)			
Ctudent					100/ of the time of		امط
responsibilities	Performed all require	ad labor	atory exe	uni or at least <i>r</i>	0% of the times	schedu	iea.
					<b>D</b> (1) <b>1</b> (1) (1)		
Screening student work (name the	Class attendance	2,0	Researc	h	Practical trainir	ng	
proportion of ECTS	Experimental work		Report		Individual work		1,7
activity so that the	Essay		Seminai essay		Laboratory exe	ercises	0,8
total number of	Tosts	0.2	Oral ova	m	Preparation for	•	0.2
equal to the ECTS	16313	0,2			laboratory exercises		0,2
value of the course)	Written exam	0,1	Project		(Other)		
Grading and evaluating student work in class and at the final exam	lecturing and the set of 10 theoretical que final exams students and final exams are is the positive asses exam or the final exa the activities in perce LV - laborat G1, G2 - mi In a case of final exa the activities in perce LV - laborat G - final exathe activities in perce $LV - laboratG - final exathe activities in perceLV - laboratG - final tesThe final grade is de50 - 61 % s62 - 74 % g75 - 87 % v88 - 100 %$	There are two midterms and final exams. The first midterm exam is after 7 weeks of lecturing and the second one is after the next 6 weeks. Each midterm test consist of 10 theoretical questions while final tests consist of 20 theoretical questions. In the final exams students that did not pass the midterm exams take part. The midterr and final exams are carried out as written tests. The requirement for passing grad is the positive assessment of laboratory exercises and 50 % points on each midterr exam or the final exam. Grade (in percentage) is formed according to the formula: Grade (%) = 0,1 LV + 0,45 (G1 + G2) the activities in percentage: LV – laboratory assessment, Grade (%) = 0,1 LV + 0,9 G the activities in percentage: LV – laboratory assessment, Grade (%) = 0,1 LV + 0,9 G the activities in percentage: LV – laboratory assessment, Grade (%) = 0,1 LV + 0,9 G the activities in percentage: So – 61 % sufficient (2) Ge = 0,2 M % good (3)					
					Number of	Availab	ility via
		Title	•		copies in the library	other	media
Required literature	T. Modrić, M. Dabro	: "Preda	vanja iz p	oredmeta			
(available in the	Elektroenergetski su	istav i ol	koliš (511	)", Sveučilište		مام	rning
media)	u Splitu, FESB, Split	, 2017.				5-160	rtal
(includy)	(interna skripta u ele	ktroničk	om oblik	u)		μu	ııaı
	D. Feretić i dr.: "Elek	D Feretić i dr : Elektrane i okoliš" Element					
	Zagreb, 2000.						

	B. Udovičić: "Elektroenergetski sustav", Kigen, Zagreb, 2005.	10	
Optional literature (at the time of submission of study programme proposal)	<ul> <li>CIGRE Technical Brochure 535, "EMC within Substations", 2013.</li> <li>CIGRE Technical Brochure 592, "Guide for A EPR on Telecommunication Systems due to Systems", 2014.</li> <li>CIGRE Technical Brochure 95, "Guide on the A.C. Power Systems on Metallic Pipelines", 1</li> <li>CIGRE Technical Brochure 290, "AC Corrosi Interference from AC Power Lines – Phenom Countermeasures", 2006.</li> </ul>	Power Plants ssessment of Faults in A.C. Influence of I 995. on on Metallic enon, Modellin	and Transferred Power High Voltage Pipelines due to ng and
Quality assurance methods that ensure the acquisition of exit competences Other (as the proposer wishes to add)	<ul> <li>Evaluation of student presence on lectures</li> <li>Evaluation of results in accordance with the abov</li> <li>Feedback from students via surveys</li> <li>Self-evaluation of teachers</li> <li>Institutional and non-institutional evaluations</li> </ul>	e learning out	comes

NAME OF THE COURSE	PRACTICUM IN DIGITAL IMAGE PROCESSING									
Code	FELO33	Year of study	3							
Course teacher	Mirjana Bonković, Ph.D., Full Professor	Credits (ECTS)	5							
Associate teachers	Ana Kuzmanić Skelin, Ph.D., Assistant Professor	Type of instruction (number of hours)	L 15	S	AE	LE 45	DE			
Status of the course	Elective	Percentage of application of e-learning								
COURSE DESCRIPTION										
Course objectives	<ul> <li>raining students to:</li> <li>gain basic understanding of digital image processing</li> <li>develop hands-on experience in using computers to process images</li> <li>apply and modify state-of-the-art algorithms to specific cases</li> </ul>									
Course enrolment requirements and entry competences required for the course	Basic programming skills	asic programming skills								
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	Students will be able to: explain how digital images are represented and manipulated in spatial and frequency domain describe characteristics of algorithms for image enhancement, feature extraction and object segmentation implement simple digital image algorithms									
	Course content					/ hc	\E ours			
	Elements of visual perception.									
	Theory of 2D linear systems. Linear image transformation. 1									
	Color image processing. Intensity transformation and spatial									
	Image filtering in the freque compression.		1							
	Image reconstruction.				1					
	Feature extraction.				2					
	Image segmentation.		2							
	Shape analysis. Motion and	alysis. Image registration.			2					
Course content	Examples of real application	ons and projects.			2					
detail by weekly	List of laboratory or design	exercises			<u> </u>	LE 0 hc	or DE ours			
(syllabus)	Introduction to Image Processing Toolbox in Matlab. Upload, view and capture an image. Mathematical operations with images. Color representation and transformation						3			
	Unary operationsi. Binary o convolution.	perationsi. Gamma correc	tions. L	inear.			3			
	Quantization and signal sar	npling. Pixelization. Alias e	effect. N	Noire	effect.		3			
	Image processing in the fre	quency domain. Discrete I	-ourier	tions			S			
	Discrete cosine transformat	tion (DCT). DCT and image		ressi	on.		5			
	Image enhancement. First of	order histogram. Histogram	n equal	izatio	n.		2			
	Histogram modeling. Media	in and Median Filter. Blur r	emova	l			ა			
	Feature detection. Spatial a	and amplitude features. Fe	atures	of the	first					
	order histogram. 2nd order	histogram. Detection of ec	lges. S	obel's	and		6			
	features.		opera		exture					

	Image segmentation. Amplitude segmentation. Manual selection of threshold. Automatic threshold selection. Edge detection. Text							6
	mage registration							6
	Image recovery. Moc Pseudo-inverse filter	deling in . Wiene	nage degi r filter.	radatior	n as a Fl	R filter. Invese	filter.	6
Format of instruction	<ul> <li>□ lectures</li> <li>□ seminars and wor</li> <li>∞ exercises</li> <li>□ on line in entirety</li> <li>□ partial e-learning</li> <li>□ field work</li> </ul>	<ul> <li>□ lectures</li> <li>□ seminars and workshops</li> <li>□ exercises</li> <li>□ on line in entirety</li> <li>□ partial e-learning</li> <li>□ field work</li> <li>□ the partial content and the partial between the</li></ul>			t assignments entor r)			
Student responsibilities	At least 70% attenda attendance of the so assignments and inc	ance of t heduled dividual	the scheo I laborato assignme	luled le ry hour ents mu	cture ho s is requist be co	urs is required. uired. All labora mpleted.	100% tory	
Screening student work (name the	Class attendance	1	Researc	:h		Practical training	ng	
proportion of ECTS credits for each activity so that the total number of	Experimental work		Report			(Other)		2
	Essay		Seminai essay	•	1.5	(Other)		
ECTS credits is	Tests	0.25	Oral exa	ım		(Other)		
value of the course)	Written exam	0.25	Project			(Other)		
Grading and evaluating student work in class and at the final exam	weeks of lecturing a Project assignments Grade is formed acc or the final exam is r Grade(%)=0.3*M1+( M1, M2- midterm/fin PROJEKTNI_ZADA kolokvij_lab – labora Final grade is given Percentage 50% - 61% 62% - 74% 75% - 87% 88% - 100% number of correctly required for passing	nd the s and lab cording t required 0.3*M2 - al exam TAK – p atory ass accordin e Gra soff goo ver exc solved grade.	econd or poratory a o the follo for passi +0.3*PRC points(% project assignment ing to the iccient (2) od (3) y good(4) ellent (5) problem	e is aft assignm owing fo ng grac DJEKTN o) signme points followin	er next ( nents wil ormula: de. NI_ZADA nt points ng table Student exams exam c Grade ons: 50	s weeks. be graded. 50 % points on TAK+0.1*kolol take part in fi onsist of 20 pro is formed ac % points on the	midtern kvij_lab bass the inal exa oblem q ccording he final	midterm m. Final uestions. to the exam is
Required literature (available in the	V Danić Obrada alil	Title		interne	elvinte	copies in the library	Availa other	bility via <sup>•</sup> media
media)	D.A. Forsyth, J. Pon Modern Approach, F	ce, Con Prentice	nputer Vis Hall, 200	sion – A 3	A A	1	eiea	ai i iii iy
Optional literature (at the time of submission of study programme proposal)	- Stockman, S - Gonzalez, V	Shapiro, Voods, [	Compute Digital Ima	er Visio age Pro	n, Prenti ocessing	ce Hall, 2001. , Addison-Wes	ley, 199	12.
Quality assurance methods that ensure the acquisition of exit competences	<ul> <li>Keeping rec</li> <li>Annual anal</li> <li>Feedback fr</li> <li>Teacher sel</li> </ul>	ords of ysis of c om stud f-evalua	student a course sta lents via s tion.	ttendar atistics surveys	nce. in terms s.	of midterm and	d finals e	exams.

	<ul> <li>Feedback from graduated students (or senior students) on course content relevance.</li> <li>Periodic institutional evolution of course teachers.</li> </ul>
Other (as the proposer wishes to add)	

NAME OF THE COURSE	PRACTICUM IN ELECTROMAGNETIC SIMULATIONS										
Code	FELO46	Year of study	3.								
Course teacher	Antonio Šarolić, Ph.D., Full Professor	Credits (ECTS)	5								
Associate teachers	Niko Ištuk, mag. ing. el.	Type of instruction (number of hours)	L 15	S	AE	LE 45	DE				
Status of the course	elective	Percentage of application of e-learning	0								
COURSE DESCRIPTION											
Course objectives - learning students for: - learning the principles of modelling and computer simulations for solvi problems in electromagnetics - using the most important program packages for electromagnetic simu											
Course enrolment requirements and entry competences required for the course	None.	one.									
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	Students will be able to: model the geometrical structures defining the electromagnetic problem calculate the fields around the radiation source using computer simulations analyze the radiation pattern and input impedance of wire and planar antennas surrounded by conductive and dielectric objects using computer simulations analyze the problems in electromagnetic compatibility using computer simulations										
	Course content		₋ or S hours	A ho	AE Durs						
	Introduction to electromagnetic field theory.     1       Basic principles of numerical modelling and overview of numerical methods.     2										
	Solving the electromagnetic problems including wire structures using method of moments (software packages NEC2, NEC4, 2 FEKO)						0				
	Solving the electromagnetic problems including planar structures using method of moments (software package ADS Momentum)						0				
Course content	Solving the electromagneti method (software package	c problems using finite diff SEMCAD X)	erence		2		0				
broken down in detail by weekly	Solving the electromagneti (software package HFSS)	c problems in time domain	)		2		0				
class schedule (syllabus)	Solving the electrically larg methods of geometrical an FEKO)	e electromagnetic problem d physical optics (software	ns usinę e packa	ge ge	2		0				
	List of laboratory or design	exercises				LE (	or DE ours				
	Introduction to electromagn	etic field theory.					3				
	Basic principles of numerica methods.	al modelling and overview	of num	erical			6				
	Solving the electromagnetic method of moments (softwa	c problems including wire s are packages NEC2, NEC4	structur 4, FEK	es usii D)	ng		6				
	Solving the electromagnetic method of moments (softwa	c problems including plana are package ADS Moment	r struct um)	ures u	ising		6				
	Solving the electromagnetic (software package SEMCA	c problems using finite diffe D X)	erence	metho	d		6				

	Solving the electromatics HFSS)	olving the electromagnetic problems in time domain (software package 6								
	Solving the electrical geometrical and physical	ly large sical opt	electrom ics (softv	agnetic vare pa	probler ckage F	ns using metho EKO)	ds of	6		
Format of instruction	<ul> <li>☑ lectures</li> <li>□ seminars and wor</li> <li>☑ exercises</li> <li>□ on line in entirety</li> <li>□ partial e-learning</li> <li>□ field work</li> </ul>	<ul> <li>☑ lectures</li> <li>□ seminars and workshops</li> <li>☑ exercises</li> <li>□ on line in entirety</li> <li>□ partial e-learning</li> <li>□ field work</li> </ul>			<ul> <li>independent assignments</li> <li>multimedia</li> <li>laboratory</li> <li>work with mentor</li> <li>(other)</li> </ul>					
Student responsibilities	Student is required t least 70% of the sch the amount of 100% laboratory exercises	tudent is required to attend the lectures and auditory exercises in the amount of at east 70% of the schedule. Student is required to attend the laboratory exercises in the amount of 100% of the schedule and to complete all tasks associated with aboratory exercises.								
Screening student work (name the	Class attendance	Class attendance 1 Research		Practical traini	ng	0,5				
proportion of ECTS	Experimental work		Report			Laboratory exe	ercises	1		
activity so that the total number of ECTS credits is	Essay		Seminal essay	ar 0,5 Individual v		Individual work	(	1		
	Mid-exam		Oral exa	exam		(Other)				
value of the course)	Written exam		Project		1	(Other)	(Other)			
Grading and evaluating student work in class and at the final exam	Students work on th seminar. The final g by the result of oral y	Students work on the assigned project task, upon completion they present it as a seminar. The final grade is based on the presented project work results, corrected by the result of oral verification.								
Required literature	Title					Number of copies in the library	Availa othe	bility via r media		
(available in the library and via other	Sheng, X.; Song, W.: "Essentials of Computational									
media)	Poljak, D: "Advance electromagnetic con 2007.	Poljak, D: "Advanced modeling in computational electromagnetic compatibility", Wiley Interscience, 2007.								
Optional literature (at the time of submission of study programme proposal)	<ul> <li>Poljak, D., E</li> <li>Structures, V</li> <li>Poljak, D., K</li> <li>Split, 2005.</li> </ul>	)orić, V., NIT Pre (ovač, N	, Antonije ss, South ., Dorić, `	ević S.: namptor V.: Num	Comput n-Bosto neričke i	er Aided Desigi n, 2007. metode u elektr	n of Wii otehnic	<sup>-</sup> e si, FESB,		
Quality assurance methods that ensure the acquisition of exit competences	Surveys providing st and jointly take care by the head of depa	udent fe of the te rtment, l	edback. eaching c nead of th	Teache quality. ne chair	ers teacl Occasic · etc.	ning related cou onal observation	arses co and ev	llaborate valuation		
Other (as the proposer wishes to										

NAME OF THE COURSE	PROCESS CONTROL									
Code	FELO12	Year of study	2							
Course teacher	Darko Stipaničev, Ph.D. Full Professor	Credits (ECTS)	5							
Associate teachers		Type of instruction (number of hours)	L 30	S 0	AE 15	LE 15	DE 0			
Status of the course	Elective	Percentage of application of e-learning	80							
	COURSE	DESCRIPTION	-							
Course objectives The aim of the course is basic knowledge to processes modelling and control.										
Course enrolment requirements and entry competences required for the course	Completed basic courses of control systems, Identificat	ompleted basic courses of automatic control (Linear control systems, Nonlinear ontrol systems, Identification and Digital control)								
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<ol> <li>Students will be able to such 1. Describe the process the mathematical model, a         <ol> <li>Enumerate and describle processes, processes</li> <li>Build process models b             <li>manage to models fluid complex processes (ch                 <li>Describe the process responses (ch                 </li> <li>Describe the process responses (ch                 </li> <li>Describe the process responses (ch                 </li> <li>Describe and impleme scheme of control (ON advanced control sche adaptive and intelligent                 </li> <li>Describe the principless Alarm, Data Acquisition                      </li> <li>Describe and perform 1 and temperature.                     </li> <li>Describe the process in maintenance.                     </li> </li> <li>Describe the process in                     </li> <li>Describe the process in                     </li> </li> <li>Describe the process in                            </li> </ol></li> <li>Describe the process in</li></ol>	<ol> <li>Build process through systematic presentation, idea management, mathematical model, automatic control.</li> <li>Enumerate and describe the fundamental processes and their models: transfer processes, processes of transition, transformation process.</li> <li>Build process models based on the equation of balance of matter and energy.</li> <li>manage to models fluidic processes, thermal processes, the mixing process, complex processes (chemical reactor, distillation).</li> <li>Describe the process measurement sensors, converters and actuatorsfor measurement and control of temperature, flow, pressure, level and density.</li> <li>Describe and implement different ways of process control, from the basic scheme of control (ON-OFF, P, PI, PD, PID control, program guidance) to the advanced control schemes (time - optimal, ratio, cascade, feedforward, optimal, adaptive and intelligent control).</li> <li>Describe the principles of distributed process control. SCADA (Scan Control, Alarm, Data Acquisitions).</li> <li>Describe and perform basic procedures for maintaining flow, pressure, level and temperature.</li> <li>Describe examples of managing complex processes.</li> </ol>								
	Course content			L	or Sours	AE hou	+ LV rs			
	Introduction. The processes and objects. A systematic approach to process control. Feedbeck control, feedforward control, open-loop control. The input - output variables						0			
Course content broken down in	The processes and process technology operations. The operations: Operations of tr transformation.	e equipment. Operations and division of technological ansfer, transition and	nd		2	1	0			
detail by weekly class schedule (syllabus)	Fluidic systems - basic laws components, modeling fluid Thermal systems - the basic thermal components, mode Complex processes and pro distillation, kemijki reactor	s of fluid mechanics, basic ic system. c laws of thermodynamics ling of thermal systems. pcess equipment - mixing,	fluidic , basic		6	1	2			
	Sensors (sensors) and the a and transfer characteristics level, pressure and other pr Actuator (actuators) - values	actuator (actuators) - input Measuring temperature, f ocess variables. s, pumps, heaters and fan	t, outpu flow, s	t	6		2			

	Basic control schema	as: four-	stage sta	tic diag	rams, o	n-off and P	2	4
	Basic control schemas: PD_PI and PID control						2	4
	Advanced control schemas: selector control, ratio control,						2	2
	cascade control, feed	dforward	control.	ontima	l contro	l adaptive	2	
	control, and intelliger	nt contro	l.	opuna		i, auaptive	2	2
	Process industry and	automa	atic contr	ol.			2	0
	⊠ Iectures			🗆 inde	epender	it assignmer	nts	
	$\Box$ $\boxtimes$ seminars and v	vorksho	ps	🗵 mul	timedia			
Format of instruction	⊠ ⊠ exercises □ o	<i>n line</i> in	entirety	🗵 labo	oratory			
	□ partial e-learning			□ wor	k with m	nentor		
	□ field work (other)							
Student responsibilities	The presence on lect Performed all require	tures in ed labor	the amo atory exe	unt of a ercises.	t least 7	'0 % of the t	imes sche	duled.
Screening student	Class attendance	1,5	Researc	ch		Practical tra	aining	
proportion of ECTS	Experimental work		Report			Individual w	vork	
credits for each activity so that the	Essay		Semina essay	r	1,5	Laboratory	exercises	1
total number of ECTS credits is	Tests		Oral exa	am		Preparation laboratory	n for exercises	
equal to the ECTS value of the course)	Written exam	2	Project			(Oth	er)	
Grading and evaluating student work in class and at the final exam	semester will be two 18 weeks. A studen June and July, stude colloquia take the w the final exam is suc The exam is compri- tasks with auditory student has a total of 25% passing the the a student has less th from the theoretical did not pass the exa All test questions stu These rules apply er and to those student The final grade is de percentage Rating 50% to 61% is suffic 62% to 74% good (3 75% to 87% of very 88% 100% Excellent The first colloquium inclusive, and on the terms of the anticipa Under Article 65 of th all forms of teaching	tests. T t can pa nts who hole sul cessfull ehensive exercise of at lea coretical han 25% part of t undents w qually to s who e termine ient (2) good (4 t (5) will take e other t ted cale he Statu and atte	The first of ass the c bject cov bject cov y finished e and in- es. The ist 50% of part of the of the part two final vill be know o student enter colle d as follo ) e the mate he rest o endar of c ute of the end: lectu	colloquit ourse b toollect ered by d practic condition on the e condition on the e on the tea classes. Faculty ures at l	the team ore the second the team ore the tas in taken ore the second the team ore the second the team ore the second the	weeks of cla tests. In the equate numb o tests. The exercises. oretical part ositive asse when it mu 25% of the ks and / or le the entire e ss the exam exam. Iled this cou ond time.	of the ma essment i of the ma essment i ist have a deposite ess than 2 exam. Stu in autum trse for the sto the sev hinations a s. If she of	enth week are held in rticipate in

	meet these requirements, the student will not be ab signature.	meet these requirements, the student will not be able to take the exam and get a signature.							
Required literature (available in the library and via other media)D.Stipaničev, Process control, lecturing notes and internal textbookNumber of copies in the libraryAvail otheD.Stipaničev, Process control, lecturing notes and internal textbooke-l internal textbooke-l e-l internal textbookD.Stipaničev, J.Marasović, Digitalno vođenje on- line, on-line (Web) udžbenik, MZT – Informatički projekt, 2004. <a href="http://laris.fesb.hr/digitalno_vodjenje">http://laris.fesb.hr/digitalno_vodjenje</a> .	Title	Number of copies in the library	Availability via other media						
	D.Stipaničev, Process control, lecturing notes and internal textbook		e-learning portal						
	e-learning portal								
Optional literature (at the time of submission of study programme proposal)	- Marlin, T.E.: Process Control, McGraw Hill, New York, 1995. - Patranabis, D.: Principles of Process Control, McGraw Hill, New Delchi, 1981.								
Quality assurance methods that ensure the acquisition of exit competences	<ul> <li>Evaluation of results in accordance with the abov</li> <li>Feedback from students via surveys</li> <li>Self-evaluation of teachers</li> <li>Institutional and non-institutional evaluations</li> </ul>	<ul> <li>Evaluation of results in accordance with the above learning outcomes</li> <li>Feedback from students via surveys</li> <li>Self-evaluation of teachers</li> </ul>							
Other (as the proposer wishes to add)									

NAME OF THE COURSE	PROTECTION AND CONTROL SYSTEMS IN SUBSTATION									
Code	FENO14	Year of study	2							
Course teacher	Elis Sutlović, Ph.D., Full Professor	Credits (ECTS)	5							
Associate teachers	Tonći Modrić, Ph.D., Assistant Professor	Type of instruction (number of hours) $\frac{L}{30}$ Percentage of		S 0	AE 15	LE 15	DE 0			
Status of the course	Obligatory	Percentage of application of e-learning	tage of 0 tion of e-learning							
COURSE DESCRIPTION										
Course objectives	<ul> <li>Training students for:</li> <li>acquire knowledge on classical and modern local as well as remote control systems in substation,</li> <li>acquiring knowledge of protective devices in electrical facilities and understanding of protection systems design,</li> <li>design and maintenance of protection and control circuits in substations</li> </ul>									
Course enrolment requirements and entry competences required for the course	None									
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<ol> <li>Students will be able to:</li> <li>Analyze and synthesize logical circuits</li> <li>Realize control circuits in electrical facilities</li> <li>Analyze and design protection circuits in substation</li> <li>Calculate and adjust protection relay parameters</li> <li>Identify and describe requirements on the substation SCADA system</li> <li>Describe the control model of the Croatian power system</li> </ol>									
	Course content	i			L	/ hc	AE ours			
	Coding. Characteristics and application of various codes.						2			
	Switching algebra: basic Ploostulates and theorems.	roperties, switching functio	on,		2		1			
	Analysis and synthesis of lo	ogical circuit. Minterms an	d		2		2			
	Method for minimizing logic	cal expression. Examples	of logic	;	2		2			
	Time dependent switches.	Flip-flops. Counters and re	egisters	6.	2					
Course content	Remote control, remote me	easurement, analog and d	igital tems.		2					
detail by weekly	SCADA for substations.				2					
class schedule (syllabus)	First midterm exam Introduction to electrical pro	otective relays. Measuring			2					
	Overcurrent Protection. De Inverse-time-overcurrent re relays.	efinite time overcurrent rela elays. Instantaneous overc	ays. surrent		2		2			
	Directional over-current pro	otection. Distance protection	on.		2		2			
	Differential protection. Differential protection.	erential protection of transf	ormer.		2		2			
	Protection of power transfo	prmer.			2	1				
	Line protection in distribution	on and transmission netwo	orks		2					
	Second midterm exam									
	List of laboratory or design	exercises				LEI	hours			

Synthesis of Logic Circuits     2       Memory elements, registers and counter     2       Programmable logic controller     2       Elektromechanic differential and overcurrent protection of transformer     2       Static differential and overcurrent protection of transformer     2       Image: Static differential and overcurrent protection of transformer     2       Static differential and overcurrent protection of transformer     2       Image: Static differential and overcurrent protection of transformer     2       Static differential and overcurrent protection of transformer     2       Image: Static differential protection system     3       Image: Static differential and overcurrent protection of transformer     2       Image: Static differential protection system     3       Student     Personsibilitie       Preparation for     2.5       Streening student     Class attendance       Vork in the total number of ECTS credits for each moliterm shate max     Personsibilitie       Ectar credits for each state part.     1     Project       Image: State differential protection on is after the next 6 weeks. In the final exams students that did not pass the mitterm exam sta ftar Y weeks of lecturing and the sec		Minimizing Logic Circuits						2	
Grading and evaluating student the final exame     Memory elements, registers and counter     2       Programmable logic controller     2       Elektromechanic differential protection of transformer     2       Static differential and overcurrent protection system     3       Witterential and overcurrent protection of transformer     2       Static differential and overcurrent protection system     3       Format of instruction     Seminars and workshops     Independent assignments       Student     on line in entirety     Independent assignments       The researce on lectures in the amount of at least 70 % of the times scheduled.       Performed all required laboratory exercises.       Student     Class attendance     1,5       Research     Practical training     2,5       Student responsibilities     Class attendance     1,6       Resourch for the course     Tests     0,3     Oral exam       Baboratory exercises     0,5     Tests     0,3       Value of the course     Written exam     0,1     Project     (Other)       Value of the course     Written exam     0,1     Project     (Other)       Value of the course     Written exam     0,1     Project     (Other)       Ital number of the course     Tests     0,3     Oral exam     Indivital number of taboratory exer		Synthesis of Logic Circuits							2
Programmable logic controller     2       Elektromechanic differential protection of transformer     2       Static differential and overcurrent protection of transformer     2       Numerical transformer protection of transformer     3       Format of instruction     Bectures     Independent assignments       Bescher     Independent assignments     Independent assignments       Container     Independent assignments     Independent assignments       Container     Independent assignments     Independent assignments       Description     Independent assignments     Independent assignments       Container     Independent assignments     Independent assignments       Description     Independent assignments     Independent assignments       Container     Independent assignments     Independent assignments       Container     Container     Independent assignments     Independent assignments       Container     Container     Independent assignments     Independent assignments       Container     The presence on lectures in the amount of at least 70% of the times scheduled.     Essay     Independent assignments       Screening student     Easa attendance     1,5     Research     Practical training       Coradits for each     Tests     0,3     Oral exam     Independent assistastatest       Valiten exam		Memory elements, registers and counter							2
Elektromechanic differential protection of transformer         2           Static differential and overcurrent protection of transformer         2           Numerical transformer protection system         3           Bill ectures         independent assignments           Bernats and workshops         multimedia           Bernats and workshops         multimedia           Bernats and workshops         multimedia           Strate differential and workshops         multimedia           Bernats and workshops         multimedia           Strate differential and work         Report           Individual work         2,5           Strate differential and more         0,3           Crast attendance         1,5           Research         Practical training           credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course         Tests           value of the course         Written exam         0,1           Project         (Other)         (Other)           There are two midterms sand final exams. The first midterm exam and it consists of 3 theoretical questions and 3 short		Programmable logic	controlle	er					2
Static differential and overcurrent protection of transformer     2       Numerical transformer protection of stansformer     3       Format of instruction     Servicases       Image: Student control in entirety     Image: Independent assignments       Image: Description     Image: Independent assignments       Image: Descrip		Elektromechanic diffe	erential	protection	n of trans	sformer	•		2
Grading and evaluating and example       0.1       Project       0.1       Project of 3         Grading and evaluating student work in class and and it consists of 3 theoretical questions and 2 numerical problems.       0.1       Project of 3       Project of 3         Grading and evaluating student work in class and and it class and at the final exam       0.1       Project of 3       Project of 3       Availability via the final exam of the final exams of 4         Grading and evaluating student work in class and at the final exam       0.1       Project of 3       Availability via the final exam of 3         Grading and evaluating student work in class and at the final exam of 3       0.5       Screening of 4       Availability via the final exam of 3       Availability via the final exam of 4         Grading and evaluating student work in class and at the final exam       0.1       Project       (Other)       0.1         Grading and evaluating student work in class and at the final exam of 3       Sortied out as written exam of the course is of 3 theoretical questions and 2 numerical problems.       The requirement for passing grade is 50 % points on each midterm exam or the final exam.         Grading and evaluating student work in class and at the final exam or the final exam or the final exam.       Grade(%) = 0.05 (AL + LA) + 0.45 (M1 + M2)         He activities in percentage:       • AL - attendance at lectures,       • LA - laboratory assessment,       • M1, M2 - test results.         The fina		Static differential and overcurrent protection of transformer					2		
Bill ectures       □ independent assignments         Seminars and workshops       □ multimedia         Bill ectures       □ an line in entirety       □ work with mentor         □ partial e-learning       □ (other)         Student       The presence on lectures in the amount of at least 70 % of the times scheduled.         Performed all required laboratory exercises.       Individual work       2,5         Screening student work (name the proportion of ECTS credits for each total number of ECTS redits for each total number of ECTS redits for each total number of the ECTS value of the course)       Seminar       Laboratory exercises       0,5         Written exam       0,1       Preparation for laboratory exercises       0,1       Report       Individual work       2,5         Value of the course)       Written exam       0,1       Preparation for laboratory exercises       0,1         Value of the course       Written exam       0,1       Project       (Other)       0,1         Verture are two midterms and final exams. The first midterm exams students that did not pass the midterm exams take part. The first midterm exam and it consists of 3 theoretical questions and 3 short numerical problems. The second mid-term is also carried out as written exam and it consists of 3 theoretical questions and 2 numerical problems.       Grade(%) = 0,05 (AL + LA) + 0,45 (M1 + M2)         Grading and evaluating student work in dass and at the final exam       M. M.2 - t		Numerical transformer protection system 3					3		
□ seminars and workshops       □ multimedia         ■ con line in entirety       □ partial e-learning       □ diffield work         □ screening student responsibilities       The presence on lectures in the amount of at least 70 % of the times scheduled. Performed all required laboratory exercises.       Class attendance       1,5         Screening student work (name the proportion of ECTS credits is equal to the ECTS value of the course)       Class attendance       1,5       Research       Practical training         ✓ Tests       0,3       Oral exam       Preparation for laboratory exercises.       0,5         Value of the course)       Written exam       0,1       Project       (Other)         There are two midterms and final exams. The first midterm exam is after 7 weeks of laboratory exercises       0,1       essay         Value of the course)       Written exam and it consists of 3 theoretical questions and 3 short numerical problems. The second one is after the next 6 weeks. In the final exams students that did not pass the midterm exam take part. The first midterm is atter 7 weeks of a theoretical questions and 2 numerical problems.         Grading and evaluating student work in class and at the final grade is determined as follows:       Fercentage       0.5 (AL + LA) + 0.45 (M1 + M2)         He activities in percentage:       • AL - attendance at lectures,       • LA - laboratory assessment,       • M1, M2 - test results.         The final grade is determined as follows: <td< td=""><td></td><td>☑ lectures</td><td></td><td></td><td>□ inder</td><td>enden</td><td>t assignments</td><td></td><td></td></td<>		☑ lectures			□ inder	enden	t assignments		
Format of instruction		seminars and wor	rkshops			media	t doolgrinnen to		
Child of instruction       □ on line in entirety       □ an line line entirety       □ an line line	Format of instruction	exercises			⊡ munn	otony			
□ partial e-learning       □ work with Hiericol         □ field work       □ (other)         Student       The presence on lectures in the amount of at least 70 % of the times scheduled. Performed all required laboratory exercises.         Screening student work (name the proportion of ECTS credits for each activity so that the total number of coll to the ECTS       Class attendance       1,5       Research       Practical training		□ <i>on line</i> in entirety				alory	ontor		
Creating and evaluating student work in class and at the final exam       □ field work       □ field work       □ field work         Student responsibilities       The presence on lectures in the amount of at least 70 % of the times scheduled. Performed all required laboratory exercises.         Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)       Class attendance       1,5       Research       Practical training         Tests       0,3       Oral exam       Laboratory exercises       0,5         Written exam       0,1       Project       (Other)       0,1         Written exam and it consists of lecturing and the second one is after the next 6 weeks. In the final exams students that did not pass the midterm exams take part. The first midterm exam or the final exam. Grade (in percentage) is formed according to the formula:         Grading and evaluating student work in class and at the final exam       Grade(%) = 0,05 (AL + LA) + 0,45 (M1 + M2)         He activities in percentage:       • AL - attendance at lectures, • LA - attendance at so follows:         Percentage       Description 50% do 1% Sufficient (2) 62% do 74% Good (3) 75% do 87% Very Good (4) 88% do 100% Excellent (5)         Required literature media)       • Marušić A. :Osonove numeričke zaštite sustava za distribuciju električne energije, stripta FER, Zagreb       §		□ partial e-learning				(otho			
Student responsibilities       The presence on lectures in the amount of at least 70 % of the times scheduled. Performed all required laboratory exercises.         Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)       Class attendance       1,5       Research       Practical training       2,5         Essay       Seminar       Laboratory exercises       0,5         ECTS credits is equal to the ECTS value of the course)       Tests       0,3       Oral exam       Preparation for laboratory exercises       0,1         Written exam       0,1       Project       (Other)       0       0         Written exam and it consists of 3 theoretical questions and 2 numerical problems. The second one is after the next 6 weeks. In the final exams students that did not pass the midterm exam stake part. The first midterm is carried out as written exam and it consists of 3 theoretical questions and 2 numerical problems.         The requirement for passing grade is 50 % points on each midterm exam or the final exam. Grade (in percentage) is formed according to the formula: Grading and evaluating student work in class and at the final exam       At attendance at lectures, LA – laboratory assessment, MI, M2 – test results.         The final grade is determined as follows: <u>Percentage</u> Description 50% do 61% Sufficient (2) 50% do 61% Sufficient (2) 50% do 74% Good (3) 75% do 87% Very Good (4) 88% do 100% Excellent (5)       Number of copies in the library e-learning portal       Availability		□ partial e-learning □ field work (other)							
Performed all required laboratory exercises.         Screening student work (name the proportion of ECTS credits for each individual work (2,5)       Class attendance       1,5       Research       Practical training       Z         Experimental work (name the proportion of ECTS credits for each individual work (2,5)       Essay       Seminar essay       Laboratory exercises       0,5         ECTS credits for each individual to the ECTS value of the course)       Tests       0,3       Oral exam       Preparation for laboratory exercises       0,1         ECTS credits is equal to the ECTS value of the course)       Written exam       0,1       Project       (Other)       0,1         Written exam and it consists of 3 theoretical questions and 3 short numerical problems. The second one is after the next 6 weeks. In the final exams students that did not pass the midterm exams take part. The first midterm is carried out as written exam and it consists of 3 theoretical questions and 2 numerical problems.       The requirement for passing grade is 50 % points on each midterm exam or the final exam. Grade (in percentage) is formed according to the formula:       Grading and evaluating student work in class and at the final grade is determined as follows:       Ectendate (in percentage:       AL - altendance at lectures,       LA - laboratory assessment,       Minuber of copies in 20% do 10% Z% do 7% Good (3) 75% do 8% Very Good (4) 88% do 100% Excellent (5)       Required literature (available in the library and via other media)       Ectioning acopies in 20% do 10% Excellent (5)       Availability via	Student	The presence on lec	tures in	the amo	unt of at	least 7	0 % of the time	s sche	duled.
Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)       Class attendance       1,5       Research       Practical training         Tests       0,3       Oral exam       Individual work       2,5         Tests       0,3       Oral exam       Preparation for laboratory exercises       0,1         There are two midterms and final exams. The first midterm exam is after 7 weeks of lecturing and the second one is after the next 6 weeks. In the final exams students that did not pass the midterm exams take part. The first midterm exam is after 7 weeks of a theoretical questions and 3 short numerical problems. The second mid-term is also carried out as written exam or the final exam. Grade (in percentage) is formed according to the formula:         Grading and evaluating student work in class and at the final exam       Grade(%) = 0,05 (AL + LA) + 0,45 (M1 + M2)         He activities in percentage: • AL - attendance at lectures, • LA - laboratory assessment, • M1, M2 - test results.       Individual work         The final grade is determined as follows:       Percentage • Description 50% do 61% Sufficient (2) 62% do 74% Good (3) 75% do 87% Very Good (4) 88% do 100% Excellent (5)         Required literature (available in the library and via other media)       E. Suttović: Predavanja iz Upravljanja i zaštite u elektronergetskom sustavu elektronergetskom sustavu elektronergetskom sustavu elent (5)       Number of copies in the library       Availability via other media portal         Optional literature (available in the	responsibilities	Performed all require	ed labor	atory exe	ercises.				
proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)       Experimental work       Report       Individual work       2,5         Tests       0,3       Oral exam       Preparation for laboratory exercises       0,1         Written exam       0,1       Project       (Other)       0,1         Written exam       0,1       Project       (Other)       0,1         There are two midterms and final exams. The first midterm exam is after 7 weeks of lecturing and the second one is after the next 6 weeks. In the final exams students that did not pass the midterm exams take part. The first midterm is carried out as written exam and it consists of 3 theoretical questions and 3 short numerical problems. The second mid-term is also carried out as written exam or the final exam. Grade (in percentage) is formed according to the formula:         Grading and evaluating student work in class and at the final exam       Grade(%) = 0,05 (AL + LA) + 0,45 (M1 + M2)         He activities in percentage: • AL - attendance at lectures, • LA - laboratory assessment, • M1, M2 - test results.       Individual work         The final grade is determined as follows: <u>Percentage Description</u> 50% do 61% Sufficient (2) 62% do 74% Good (3) 75% do 87% Very Good (4) 85% do 100% Excellent (5)         Required literature (available in the library and via other media)       E. Sutlović: Predavanja iz Upravijanja i zaštite u elektroenergetskom sustavu M. Sodan: Automatizacija logičkim sklopovima, Tehnička knijga, Zagreb       §	Screening student	Class attendance	1,5	Researc	h		Practical training	ng	
Credity is of that the total number of ECTS credits is equal to the ECTS value of the course)       Essay       Seminar essay       Laboratory exercises       0,5         Value of the course)       Written exam       0,1       Project       (Other)       0,1         Image: Course of the course       Written exam       0,1       Project       (Other)       0,1         Image: Course of the course       Written exam       0,1       Project       (Other)       0,1         Image: Course of the course       Written exam       0,1       Project       (Other)       0,1         Image: Course of the course       Written exam       0,1       Project       (Other)       0,1         Image: Course of the course       Written exam       0,1       Project       (Other)       0,1         Image: Course of the course       Written exam       0,1       Project       (Other)       0,1         Image: Course of the course of the course of the course of the exat with the second one is after the next 6 weeks. In the final exams students that did not pass the midterm exams take part. The first midterm exam and it consists of 3 theoretical questions and 2 numerical problems.       The requirement for passing grade is 50 % points on each midterm exam or the final exam students the activities in percentage:       AL - attendance at lectures,       LA - laboratory assessment,       MI, M2 - test results. <tr< td=""><td>proportion of ECTS</td><td>Experimental work</td><td></td><td>Report</td><td></td><td></td><td>Individual work</td><td>(</td><td>2,5</td></tr<>	proportion of ECTS	Experimental work		Report			Individual work	(	2,5
Cardination of the ECTS readits is equal to the ECTS readits is the ECTS readits readits re	activity so that the	Essay		Seminai essay	r		Laboratory exe	ercises	0,5
Grading and evaluating student work in class and at the final exam       0,1       Project       (Other)         Grading and evaluating student work in class and at the final exam       There are two midterms and final exams. The first midterm exam is after 7 weeks of lecturing and the second one is after the next 6 weeks. In the final exams students that did not pass the midterm exams take part. The first midterm is carried out as written exam and it consists of 3 theoretical questions and 3 short numerical problems. The second mid-term is also carried out as written exam and it consists of 3 theoretical questions and 2 numerical problems.         Grading and evaluating student work in class and at the final exam       Grade(%) = 0,05 (AL + LA) + 0,45 (M1 + M2)         Written exam       Grade(%) = 0,05 (AL + LA) + 0,45 (M1 + M2)         the activities in percentage:       • AL - attendance at lectures,         • LA - laboratory assessment,       • M1, M2 - test results.         The final grade is determined as follows:       Percentage         Percentage       Description         50% do 61%       Sufficient         (available in the library and via other media)       E. Sutlović: Predavanja iz Upravljanja i zaštite u elektroenergetskom sustavu         elektroenergetskom sustavu       e-learning portal         M. Šodan: Automatizacija logičkim sklopovima, Tehnička knjiga, Zagreb       5	ECTS credits is	Tests	0,3	Oral exa	am		Preparation for laboratory exe	r rcises	0,1
There are two midterms and final exams. The first midterm exam is after 7 weeks of lecturing and the second one is after the next 6 weeks. In the final exams students that did not pass the midterm exams take part. The first midterm is carried out as written exam and it consists of 3 theoretical questions and 3 short numerical problems. The second mid-term is also carried out as written exam and it consists of 3 theoretical questions and 2 numerical problems.Grading and evaluating student work in class and at the final examThe requirement for passing grade is 50 % points on each midterm exam or the final exam. Grade (in percentage) is formed according to the formula:Grading and evaluating student work in class and at the final examGrade(%) = 0,05 (AL + LA) + 0,45 (M1 + M2)Grade(%) = 0,05 (AL + LA) + 0,45 (M1 + M2)the activities in percentage: • AL - attendance at lectures, • LA - laboratory assessment, • M1, M2 - test results.The final grade is determined as follows: Percentage 20% do 61% 80 Sufficient (2) 62% do 74% 60 cod (3) 75% do 87% 80 do 100% 80 Excellent (5)Required literature (available in the library and via other media)E. Sutlović: Predavanja iz Upravljanja i zaštite u elektroenergetskom sustavu M. Sodan: Automatizacija logičkim sklopovima, Tehnička knjiga, ZagrebAvailability via other media e-learning portalOptional literature (at the time of energije, skripta FER, Zagreb- Marušić A. :Osnove numeričke zaštite su zadisti suzdava za distribuciju električne energije, skripta FER, Zagreb	value of the course)	Written exam	0,1	Project			(Other)		
Required literature (available in the library and via other media)TitleNumber of copies in the libraryAvailability via other mediaE. Sutlović: Predavanja iz Upravljanja i zaštite u elektroenergetskom sustavu M. Šodan: Automatizacija logičkim sklopovima, Tehnička knjiga, Zagrebe-learning portalOptional literature (at the time of- Marušić A. :Osnove numeričke zaštite sustava za distribuciju električne energije, skripta FER, Zagreb	Grading and evaluating student work in class and at the final exam	lecturing and the sec that did not pass the written exam and it of problems. The secon of 3 theoretical ques The requirement for exam. Grade (in per Content of the activities in percon of AL - attenda of LA – laborat of M1, M2 – te The final grade is de <u>Percentage</u> 50% do 61% 62% do 74% 75% do 87% 88% do 100%	cond on e midterr consists nd mid-t stions an passing centage Grade(% entage: ance at la cory asso st result etermine <u>Desc</u> Good Very Excel	e is after n exams of 3 theo erm is als of 2 nume grade is grade is of 2 nume grade is of 2 nume grade is 0 = 0,05 ectures, essment, s. d as follo cription cient (2 1 (3) Good (4 llent (5)	the next take par pretical q so carrie erical pro 50 % po ed accord (AL + LA (AL + LA	6 weel t. The f uestion d out a oblems. oints on ding to	ks. In the final e irst midterm is is and 3 short n s written exam each midterm the formula: 5 (M1 + M2)	exams carried oumerid and it exam	students l out as cal consists or the final
ControlE. Sutlović: Predavanja iz Upravljanja i zaštite u elektroenergetskom sustavue-learning portalM. Šodan: Automatizacija logičkim sklopovima, Tehnička knjiga, Zagreb5Optional literature (at the time of- Marušić A. :Osnove numeričke zaštite sustava za distribuciju električne energije, skripta FER, Zagreb	Required literature		Title	•			Number of copies in the library	Availa othe	ability via er media
Initial of the vite of th	(available in the	E. Sutlović: Predava	inja iz U	pravljanja	a i zaštite	e u		e-le	earning
M. Sodan: Automatizacija logičkim sklopovima, Tehnička knjiga, Zagreb       5         Optional literature (at the time of       - Marušić A. :Osnove numeričke zaštite sustava za distribuciju električne energije, skripta FER, Zagreb	media)	elektroenergetskom	elektroenergetskom sustavu				F		
Optional literature (at the time of - Marušić A. :Osnove numeričke zaštite sustava za distribuciju električne energije, skripta FER, Zagreb		M. Šodan: Automatizacija logičkim sklopovima,						oortal	
		M. Šodan: Automati Tehnička knjiga, Zag	zacija lo greb	gičkim sk	lopovim	а,	5		oortal

submission of study programme proposal)	<ul> <li>Požar, H. :Visokonaponska rasklopna postrojenja, Tehnička knjiga, Zagreb</li> <li>Božuta, F. :Automatski zaštitni uređaji elektroenergetskih postrojenja, Svjetlost, Sarajevo</li> </ul>
Quality assurance methods that ensure the acquisition of exit competences	<ul> <li>Evaluation of results in accordance with the above learning outcomes</li> <li>Feedback from students via surveys</li> <li>Self-evaluation of teachers</li> <li>Institutional and non-institutional evaluations</li> </ul>
Other (as the proposer wishes to add)	

NAME OF THE COURSE	PROTECTION AT SUBST	ATIONS							
Code	FENO20	Year of st	udy	2					
Course teacher	Petar Sarajčev, Ph.D., Associate Professor	Credits (E	ECTS)	5					
Associate teachers	Robert Kosor, dipl. ing.	Type of i (number	nstruction of hours)	L S AE 30 15		LE 15	DE		
Status of the course	Obligatory	Percenta applicatio	ge of on of e-learning	0		•			
	COURS	E DESCR	PTION						
Course objectives	<ul> <li>Training students for:</li> <li>understanding basic principles of power system protection</li> <li>permanent adoption of principles of distribution network relay protection design</li> <li>permanent adoption of transformer protection design</li> <li>setting up and solving transformer differential protection problems</li> <li>understanding principles of distance protection</li> </ul>								
Course enrolment requirements and entry competences required for the course	None								
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<ul> <li>Students will be able to:</li> <li>calculate and select current transformers for relay protection applications</li> <li>design protection of distribution network considering its neutral point treatment</li> <li>calculate distribution network relay protection function settings</li> <li>design protection of power transformers (two and three windings)</li> <li>select appropriate numerical relays for transformer protection</li> <li>calculate protection settings of distance relays</li> </ul>								
	Course content						AE	hours	
	Short-circuit calculations overview. Earth fault. Petersen coil.								
	Current and voltage transformers, Toroid transformers       3         Distribution nework relay protection fundamentals.       0         Overcurrent protection, Earth-fault protection, Overvoltage       6         protection, Directional protection       0							3	
	Relay protection in insulated distribution networks, Protection of neutral earthing resistor. Busbar protection					4		3	
Course content broken down in detail by weekly	Power transformer relay p REF protection, Thermal p Reverse interlocking	rotection, protection,	Differential prote Overcurrent pro	ection, tection	,	4		3	
class schedule (syllabus)	Transmission network rela Distance protection, In-fee measurement, Quadrilater swing blocking	y protectio d compen al protection	on fundamentals sation, Impedan on characteristic	, ice c, Powe	er	6		3	
	Teleprotection schemes, B	Breaker fai	ure			3		1	
	List of laboratory or design	exercises						or DE	
	Electromechanical, static ar	nd numerio	cal protection rel	lays, Te	esting			3	
	DIGSI software package by	Siemens	for protection re	lay set	tings			6	
	SIGRA software package b	y Siemens	for post-morten	n analy	vsis			3	
	Visit to the GIS substation a	and live int	eraction with pro	otectior	n relay	S		3	
Format of instruction	<ul> <li>☑ lectures</li> <li>□ seminars and workshops</li> <li>☑ exercises</li> </ul>	S	<ul> <li>□ independent</li> <li>⊠ multimedia</li> <li>⊠ laboratory</li> </ul>	assigr	ments	5			
	1		-						

	□ <i>on line</i> in entirety			□ work with mentor				
	□ partial e-learning □ field work				(othe	er)		
Student responsibilities								
Screening student work (name the	Class attendance	0,5	Researc	h		Practical traini	ng	
proportion of ECTS	Experimental work		Report			Individual wor	k	2,5
activity so that the total number of ECTS credits is equal to the ECTS value of the course)	Essay		Seminar essay			Laboratory excercises		1,0
	Tests	0,5	Oral exa	m		(Other)		
	Written exam	0,5	Project			(Other)		
Grading and evaluating student work in class and at the final exam	lecturing and the sec 10 theoretical quest theoretical questions pass the midterm ex- written tests. The r laboratory exercises (in percentage) is for the activities in perce	There are two midterms and final exams. The first midterm exam is after 7 lecturing and the second one is after the next 6 weeks. Each midterm test of 10 theoretical questions and numerical problems and final tests const theoretical questions and numerical problems. In the final exams students th pass the midterm exams take part. The midterm and final exams are carri written tests. The requirement for passing grade is the positive asses laboratory exercises and 50% points on each midterm exam or the final exam (in percentage) is formed according to the formula: Grade(%) = 0,5 (M1 + M2) the activities in percentage: M1, M2 – test results.					m test co sts consis udents tha are carrie e assess final exan	nsists of at of 10 at did not d out as ment of n. Grade
Required literature (available in the library and via other		Title	)			Number of copies in the library	Availab other	ility via media
media)	P. Sarajčev, A	utorizira	ina preda	vanja, I	FESB		e-learnir	ng portal
Optional literature (at the time of submission of study programme proposal)	- P. M. Anderson,	P. M. Anderson, Power system protection, IEEE Press, New York, 1999.						
Quality assurance methods that ensure the acquisition of exit competences	<ul> <li>Evaluation of res</li> <li>Feedback from s</li> <li>Self-evaluation of</li> <li>Institutional and</li> </ul>	Evaluation of results in accordance with the above learning outcomes Feedback from students via surveys Self-evaluation of teachers Institutional and non-institutional evaluations						
Other (as the proposer wishes to add)								

NAME OF THE COURSE	RADIO COMMUNICATIO	NS							
Code	FELO30	Year of st	tudy	3.	3.				
Course teacher	Zoran Blažević, Ph.D., Full Professor	Credits (E	ECTS)	5					
	Maia Škilio. Ph D	Type of ir	struction	L	S	AE	LE	DE	
Associate teachers	Assistant	(number	of hours)	30	0	0	30	0	
Status of the course	Elective	Percenta applicatio	ge of on of e-learning	0					
	COURSE	URSE DESCRIPTION							
Course objectives	<ul> <li>Training students for:</li> <li>understanding and appradio-propagation,</li> <li>basic radio-channel ph</li> <li>permanent adoption ar engineering.</li> </ul>	<ul> <li>Fraining students for:</li> <li>understanding and application of basic principles and mechanisms of Earth radio-propagation,</li> <li>basic radio-channel physical phenomena modelling,</li> <li>permanent adoption and deepening of knowledge in the field of radio</li> </ul>							
Course enrolment requirements and entry competences required for the course	None.	engineering. lone.							
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<ul> <li>Students will be able to:</li> <li>define the fundamental phenomena, the quantities and the laws of Earth radio-propagation,</li> <li>apply fundamental laws of radio-propagation and model basic radio-channels,</li> <li>calculate and estimate basic radio-channel parameters,</li> <li>apply basic methods of radio-channel measurements</li> </ul>								
	Course content					L hours	/ hc	AE ours	
	Introduction to Radio Communications. History perspective of radio engineering. SL units					2		-	
	Antennas. Radiowave prop	agation.				4		3	
	Atmospheric influence on r troposphere.	eric influence on radio-propagation-propagation by ere.						1	
Course content	Atmospheric influence on r ionosphere.	adio-propa	agation-propaga	tion by	,	4		1	
broken down in	Propagation by diffraction					4		3	
detail by weekly	Propagation by reflection.					6		3	
class schedule	Digital radio-communicatio	n channel.	Shannon theor	em.		2		4	
(Syllabus)	Cellular radio systems					2		1	
	Midterm exam								
	List of laboratory exercises						LEI	hours	
	Introduction to laboratory in	struments	, devices and ot	her equ	Jipmer	nt		1	
	Antenna parameters measu	urements						5	
	Radio-channel parameters	measurem	ents by spectru	m anal	yser			4	
	Measurements of radio-cha	nnels by v	ector network a	nalyse	r		_	3	
	Software estimations of rad	io-cnanne	S					2	
Format of instruction	<ul> <li>☑ lectures</li> <li>□ seminars and workshops</li> <li>☑ exercises</li> <li>□ on line in entirety</li> <li>□ partial e-learning</li> <li>□ independent assignments</li> <li>□ multimedia</li> <li>☑ laboratory</li> <li>□ work with mentor</li> </ul>								
	⊠ field work		니 (othei	r)					

Student responsibilities	The presence on lectures in the amount of at least 70 % of the times scheduled. Performed all laboratory exercises required.								
Screening student	Class attendance	2,0	Research		Practical traini	ng			
proportion of ECTS	Experimental work		Report		Individual work	Individual work			
credits for each activity so that the	Essay		Seminar essay		Laboratory exe	ercises	0,8		
total number of ECTS credits is	Tests	0,5	Oral exam		Preparation fo laboratory exe	r rcises	0,2		
value of the course)	Written exam		Project	(Other)					
Grading and evaluating student work in class and at the final exam	of theoretical question midterm exams take out as written tests. laboratory exercises rest of the grade dep percentage) is forme the activities in percent • NP - attenda • LV - laborat	here are one midterm and one final exam. Both midterm test and final test consis f theoretical questions and numerical problems. The students that did not pass the nidterm exams take part In the final exams. The midterm and final exams are carried ut as written tests. The requirement for passing grade is the positive assessment of boratory exercises, 40 % points on the midterm exam or the final exam, and the est of the grade depends on the seminary work presented by the student. Grade (in ercentage) is formed according to the formula: Grade(%) = 0,1 NP + 0,1 LV + 0,4 (M + S) ne activities in percentage: NP - attendance at lectures, LV – laboratory assessment, M – test results., S – seminary work results and presentation							
	• S – seminar	y work i	esults and prese	entation					
	• S – seminar	y work r	results and prese	entation	Number of copies in the library	Availabi other n	lity via nedia		
Required literature (available in the	<ul> <li>S – seminar</li> <li>I. Zanchi, Z. Blaževio</li> </ul>	y work i Title	results and prese	entation	Number of copies in the library	Availabi other n e-lear	lity via nedia ning		
Required literature (available in the library and via other media)	<ul> <li>S – seminar</li> <li>I. Zanchi, Z. Blaževio predavanja, FESB</li> <li>Boithias, L.: Radio W Academic 1987.</li> </ul>	Title ć: Radic	results and prese	entation Oxford	Number of copies in the library	Availabi other n e-lear port	<b>lity via</b> nedia ning tal		
Required literature (available in the library and via other media)	<ul> <li>S – seminar</li> <li>S – seminar</li> </ul>	ý work r Title ć: Radio Vave Pre	results and prese komunikacije, opagation, North cije, Školska knj	o Oxford iga -	Number of copies in the library	Availabi other n e-lear port	lity via nedia ning tal		
Required literature (available in the library and via other media) Optional literature (at the time of submission of study programme proposal)	<ul> <li>S – seminar</li> <li>S – seminar</li> <li>I. Zanchi, Z. Blaževia predavanja, FESB</li> <li>Boithias, L.: Radio W</li> <li>Academic 1987.</li> <li>Zentner, E.: Radioko Zagreb, 1980.</li> <li>Zentner, E.: Antene</li> <li>Parsons, J. D.: "The</li> <li>Publishers - London</li> <li>Doble, J.: "Introducti</li> <li>Communications", A</li> </ul>	ti radiose y work r Title ć: Radio Vave Pre omunika i radiose Mobile , GB, 19 on to Ra or to Ra	results and prese komunikacije, opagation, North cije, Školska knj ustavi, Graphis Z Radio Propagati 992. adio Propagatior ouse Boston - Lo	ontation Oxford iga - Zagreb, 2 on Chai on Chai on for Fixe	Number of copies in the library 1 2 2001. anel", Pentech ed and Mobile BB, 1996.	Availabi other n e-lear port	lity via nedia ning tal		
Required literature (available in the library and via other media) Optional literature (at the time of submission of study programme proposal) Quality assurance methods that ensure the acquisition of exit competences Other (as the	<ul> <li>S – seminar</li> <li>S – seminar</li> <li>I. Zanchi, Z. Blaževio predavanja, FESB</li> <li>Boithias, L.: Radio W Academic 1987.</li> <li>Zentner, E.: Radioko Zagreb, 1980.</li> <li>Zentner, E.: Antene Parsons, J. D.: "The Publishers - London Doble, J.: "Introducti Communications", A</li> <li>Evaluation of res</li> <li>Feedback from s</li> <li>Self-evaluation of</li> <li>Institutional and</li> </ul>	Title Title ć: Radic Vave Pro omunika i radiose , GB, 19 on to Ra , GB, 19 on to Ra , rtech H sults in a students of teach non-ins	results and prese	on Chain on Chain for Fixe on Chain for Fixe ondon, C the abo	Number of copies in the library 1 2 2001. nnel", Pentech ed and Mobile 5B, 1996. ve learning out	Availabi other n e-lear port	lity via nedia ning tal		

NAME OF THE COURSE	RENEWABLE ENERGY	SOURCES						
Code	FENO29	Year of study	3					
Course teacher	Damir Jakus, Ph.D. Assistant Professor	Credits (ECTS)	5					
Associate teachers	Josip Vasilj, Ph.D.	Type of instruction (number of hours)LSAELEDE300030-						
Status of the course	Elective	Percentage of application of e-learning	30					
	COURSE	DESCRIPTION						
Course objectives	Training students for: - Understanding the operating character financing options - Implementation of RES - Assessment of the - Selection of the op RES - Analysis of networ - Project economic	e specifics related to the we eristics of renewable energ a legislative framework th e annual energy potential f otimal parameters and proj	orking p gy sourc at prom for varior ject solu tion of R different	orincipl otes as otes p us type utions f ES t RES	es ar well a produc es of for di	nd as proj ction fi RES fferent	ject rom	
Course enrolment requirements and entry competences required for the course	None							
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<ul> <li>Students will be able to:</li> <li>Define different RES to main system compone</li> <li>Explain and critically a RES</li> <li>Estimate the annual el plants</li> <li>Perform project profita</li> <li>Define the basic techn connecting to the powe</li> <li>Conduct the RES grid</li> <li>Explain the impact of F development, planning</li> <li>Select the parameters</li> </ul>	echnologies, explain their ents for different RES plant nalyze different financial p ectricity production for cer bility assessments for cert ical requirements which no er system connection analysis and e RES large scale integration g, operation and managem for standalone and grid co	methods ts promotio rtain type eed to b elaborate n on pov nent onnecte	s of op on mec es of F es of R be met e gird i wer syste d syste	berati chanis RES p ES by R impa stem	on and sms fc power ES wł cts	d list or nen	
	Course content			L	or S	A	Æ	
Course content broken down in detail by weekly class schedule (syllabus)	<ol> <li>RENEWABLE ENERG The need for renew The main sources ar Properties of renew The current status of 2 RES REGULATION FR The EU directive on</li> </ol>	Y SOURCES INTRODUCTIC able energy sources nd forms of energy able energy sources of renewable energy RAMEWORK RES	ON		2			

	The working principle of WPP							
	WPP grid connection requirement	.s						
	The WPP market and the situation	n in Croatia			 			
	4 SOLAR POWER PLANTS				 			
	Calculation of solar radiation				]			
	Solar power plants working princip	ples and main parts	4		]			
	PV power plant electricity product	tion			]			
	Grid connected and standalone sys	stems			L			
	5 SOLAR THERMAL POWER PLANTS		1					
	6 IMPACT OF WIND AND PV POWER	R PLANTS ON	2					
	POWER SYSTEM OPERATION AND	MANAGEMENT	2		 L			
	7 HYDRO POWER PLANTS							
	Hydropower resources				 			
	Hydro power and energy		4		 			
	The basic components, their roles,	, performance and	4		 			
	operating principles							
	Turbines and generators for small	НРР			 			
	8 BIOMASS ENERGY				 [			
	Types and basic characteristics of I	biomass						
	The different technologies for utili	ization of biomass	2		]			
	The potentials and biomass produce	ction	3		]			
	Different principles of biomass cor	nversion into solid						
	and liquid fuels				L			
	9 GEOTHERMAL ENERGY							
	The origin and nature of geotherm	nal energy						
	Geothermal resources		3					
	Direct use of geothermal energy for	or heating			 			
	The use of geothermal energy for a	electricity gen.			 			
	10 OTHER TYPES OF RES				 			
	Wave energy converters		2					
	Tidal power		3					
	Ocean thermal energy converters							
	List of laboratory or design exercises			LE or DE	 			
	1 Technical visit to roof mounted P	V nower plant		nours A				
	2 Technical visit to wind nower plan	<u>י אסיייבו אומוונ</u> אז		4 6				
	3 Introduction to software nackage	Homer		4				
	4 Project assignment regarding star	ndalone and grid connect	ed					
	system design and profitability of	alculation	Cu	4				
	5. Project assignment regarding sola	ar collector system design	and					
	profitability analysis			4				
	6. Techno-economic analysis of inve	estment in PV power plant	:	4				
	7. Analysis of RES connection impacts on power losses and			4				
	voltage profile change in the MV		4					
	⊠ lectures	ndependent assignments						
	□ seminars and workshops	muependent assignments multimedia						
Format of instruction		aboratory						
	□ on line in entirety	work with mentor						
	partial e-learning     work with mentor							
	⊠ field work							
Student responsibilities	<ul> <li>The presence or time.</li> <li>Completed all re</li> <li>Completed and</li> </ul>	n lecture equired le positivel	es in the a aboratory	mount exerci semina	of at lea ses. ar assig	ast 70 % of the schedul	ed	
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Screening student	Class attendance	Class attendance 1 Research Practical t						
proportion of ECTS	Experimental work		Report		1	Self work	1.5	
credits for each activity so that the total number of	Essay		Seminar essay			Laboratory work	0.5	
ECTS credits is	Tests	0.5	Oral exa	m		(Other)		
equal to the ECTS value of the course)	Written exam	0.5	Project			(Other)		
Grading and evaluating student work in class and at the final exam	During the semester midterm exam will be in the last week of s will be given their wo can pass the class laboratory work ass students can pass re Also, if the student p he is not obliged to class subject is divid exams. Students who have f subject by taking the term. The last chand be held in the secon commission exam st regarding their previ- requirement for posi exam as well as pos The requirement for each part of the cou- the entire course s positively evaluated on the basis of all ac- Grade (%) = 0,35Xg Grade (%) = 0,7Xg wherein: • G1, G2 – points of exams • G – points obtained • S – point given for The final grade is de Grade (%) 50 % do 61 62 % do 74 75 % do 87 88 % do 10 Exam terms: The first and se	r there v e in the o summer ork assig s by pa- signmen eaming p asses o re-take ded into failed to e disciplice to pa- ided into failed to e disciplice to pa- sitive man strive man set o failed to e disciplice to pa- sitive man strive man failed to e disciplice to pa- seminar failed to e disciplice to pa- seminar failed to e disciplice to seminar failed to e disciplice to failed	vill be two eighth we semested inments we ssing two ts. In the part of that part of the auturnave to re ults in mi rk is that if rk from se ect during on discip according 5Xg2 + 0,3 (for disc of disciplin assignm d as follow we exc hal exam:	o midte ek of s r. As a /hich w o midte e two f ich the class a d two f ich the class a m whice bject is mn exa- take w d-term the stur- the stur- ent. Th to the 3Xs iplinary a subje ary and ent m subject inary ficient o f the subject is mn exa- take w d-term the stur- the st	rm exar ummer part of ill be gra erm exa final exa y didn't material exam i ding to s fter two ch is org through am perio hole ex and fin dent has assignr e studen rm and co ie final s formula and co ie final s formula (2) d(4) (5) ary / Ma	ns covering lectures. T semester, and the seco laboratory exercises st aded after completion. S ams and by completin ams in February and pass through midterm of s through first final exar n the second final exar separation defined for m final exams can try to pa ganized in first part of a h commission exam wh od. During the disciplina am covering both subject al exams. In autumn te s at least 50% success nent. t has at least 50% poin final exams (or 50% poin final exams (or 50% poin mission exam), as w score (in percentage) is to mission exam) during midterms and(or ission exam	he first nd one udents Student g their March, exams. n, then m. The nidterm ass the autumn lich will ary and ct parts on the ts from ints for well as formed	

	The disciplinary and commission exam: August / September							
	Under the Article 65 of the Faculty Statute, the student is required to participate in all forms of teaching and attend: lectures at least 70% of scheduled time and laboratory exercises 100% of scheduled time. If you do not meet these requirements, the student will not be able to take the examination							
	Title	Number of copies in the library	Availability via other media					
Required literature (available in the library and via other media)	Jakus, D.: Obnovljivi izvori energije, skripta + slajdovi s predavanja + dodatni materijali		e-learning					
	Jakus, D., Krstulović Opara, J. : Obnovljivi izvori energije – upute za laboratorijske vježbe -, Split 2013.		e-learning					
	Šljivac, D., Šimić, Z.: Obnovljivi izvori energije s osvrtom na uštede, udžbenik, ETF Osijek, 2008.							
	Rajkovič, D.: Proizvodnja i pretvorba energije, Rudarsko-geološko-naftni fakultet, Zagreb, 2011							
Optional literature (at the time of submission of study programme proposal)	<ul> <li>L. Freris, D.Infield: Renewable Energy in Power S</li> <li>T. Ackerman: Wind Power in Power Systems, Wi</li> <li>J. Twidell, T. Weir: Renewable Energy Resources</li> </ul>	Systems, Wile ley, 2012. s, Taylor √ Fı	ey, 2008 rancis, 2005.					
Quality assurance methods that ensure the acquisition of exit competences	<ul> <li>Keeping records of student class attendance</li> <li>Annual review of the exam success</li> <li>Feedback from students via surveys</li> <li>Self-evaluation of teachers</li> <li>Feedback on the subject relevance from the form already graduated</li> </ul>	er students w	/ho have					
Other (as the proposer wishes to add)								

NAME OF THE COURSE	SENSORS AND TRANSDUCERS								
Code	FELO36	Year of study	3.						
Course teacher	Josip Musić, Ph.D., Assistant Professor	Credits (ECTS)	edits (ECTS) 4						
Associate teachers	Ivo Stančić, Ph.D., Assistant Professor	Type of instruction (number of hours)	L 30	S 0	AE 0	LE 15	DE 0		
Status of the course	Elective	Percentage of application of e-learning	0				1		
	COURSE	E DESCRIPTION							
Course objectives	<ul> <li>Training students for:</li> <li>understanding role and measurement transduct</li> <li>acquiring basic practical issues while using different understanding working advantages and disadvantages disadvant</li></ul>	d significance of measurem cers in autonomous system al knowledge about physic erent measurement equipn principles of different sens vantages. A/D and D/A converters or	nent ec ns via c al limit nent ar sors as	uipme control ations d trans well a or char	nt and loops and p sduce is thei acteris	l ossible rs. r	0		
Course enrolment requirements and entry competences required for the course	None								
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<ul> <li>students will be able to:</li> <li>recognize sensors and transducers in automatic control loops.</li> <li>explain importance of sensors and transducers in automation.</li> <li>explain basic characteristic of measurement transducers (and sensors).</li> <li>give examples of some of widely used sensors (pressure sensors, flow sensors, temperature sensors, optical sensors, inertial sensors).</li> <li>examine sensor datasheets,</li> <li>apply basic measurement transducers.</li> <li>evaluate A/D and D/A work principle and its influence on measurement.</li> </ul>								
	Course content						or S		
	Introductory considerations control. Measurement sense	and systematic approach sor and actuators in the co	to auto ntrol lo	omatic op.			2		
	Sensor and transducer type sensor characteristics (acc	es. General consideration uracy, sensitivity, repeatat	of mos pility, e	t impo tc.)	rtant		2		
	A/D and D/A converters an	d their influence and sense	or char	acteris	stics.		2		
Course content	Application examples of me Pressure sensors: capaciti (working principles, charac	easurement sensors in cor ve, inductive, resistive and teristics and applications).	piezo	ops. electric	;		2		
broken down in detail by weekly	Inertial sensors: accelerometer (working principles, characteristics and applications). Inertial sensors: accelerometer (working principles, characteristics and applications). Inertial sensors: gyroscope (working principles, characteristics and applications).								
class schedule (syllabus)									
	Inertial sensor units (inertia principles, characteristics a	Il sensors + magnetometer and applications.	rs): wo	rking			2		
	Optical sensors: photoresis (encoders) and shift senso applications).	stors, photodiodes, position rs (working principles, cha	n senso racteria	ors stics ar	nd		2		
	Pressure and force sensors and applications.	s: types, working principles	s, char	acteris	tics		2		
	Flow sensors: mechanical, characteristics and applica	ultrasonic and magnetic (v tions).	working	g princ	iples,		2		

	Intelligent sensors. Dislocated measurement devices: measuring at distant location.								
	Actuators and sensors: functional unit.								
	List of laboratory or o	List of laboratory or design exercises							
	Temperature sensors	: applic	ation ad	neasur	ement o	characteristics.	nours 3		
	Pressure and touch s	sensors:	QTC (qu	antum	tunnelir	ng compound) and	3		
	tasters.	sters.							
	Distance sensors: ca	pacitive	ultrasou	nd and	laser.		3		
	Servo motors: contro	l and m	easurem	ent tran	sducers	5.	3		
	⊠ lectures			□ inda	nondon	t aggianmanta			
	seminars and wor	kshops			ependen timedia	it assignments			
Format of instruction	⊠ exercises			⊠ labo	oratory				
	□ <i>on line</i> in entirety				k with m	nentor			
	□ partial e-learning				(othe	er)			
Student		turoc in	the amo	unt of a	t looct 7	70 % of the times sch	dulad		
responsibilities	Performed all require	ed labor	atory exe	rcises.			auleu.		
Screening student	Class attendance	1	Researc	h		Practical training			
proportion of ECTS	Experimental work		Report			Individual work	1,2	2	
credits for each activity so that the	Essay		Seminai essay			Laboratory exercises	1,5	5	
total number of ECTS credits is	Tests	0,1	Oral exa	ım		Preparation for			
equal to the ECTS	Written exam	0.1	Project			(Other)			
	During the competer	thoro o		dtarma				- 7	
Grading and evaluating student	weeks of lectures and the second one is after 13 weeks of lectures. Each midterm test (as well as the final test) is carried out in a written format with duration of 90 minutes. It consists of both theoretical questions and numerical problems. In the final exams students that did not pass the midterm exams take part. The final exam test consists of 6 theoretical questions and numerical problems. The requirement for passing grade is the positive assessment of laboratory exercises and 50 % points on average midterm exam ((M1 + M2)/2) or the final exam. Students are allowed to have at least 40% of total points on each midterm exams, as long as the final midterm average is at least 50% of total points. Grade (in percentage) is formed according to the formula: Grade(%) = $0.5L + 0.5(M1 + M2)$								
work in class and at the final exam	<ul> <li>L – laborator</li> <li>M1, M2 – mi</li> </ul>	y asses dterm te	ssment, est result	5.					
Final grade (based on percentages) is formed as follows: Percentage Grade 50% do 62% sufficient (2) 63% do 74% good (3) 75% do 86% very good (4) 87% do 100% excellent (5)						lows:			
	According to Article teaching activities a exercises. In accord grading 100% of all I	65. of I attending lance w aborato	Faculty's g at leas vith that s ry exercis	Bylaw, st 70% student ses. If s	studen of lect is requ tudent c	t is required to partic tures, and 100% of ired to solve and tur does not meet these c	pate in a laborato n over f riteria, sł	all ory <sup>i</sup> or he	

	or he won't be able to take part in the final exam, and course the next year.	or he won't be able to take part in the final exam, and will be required to enroll in the course the next year.						
	Title	Number of copies in the library	Availability via other media					
	Božičević, J.: Temelji automatike 1, Školska knjiga , Zagreb, 2008.	2						
Required literature (available in the library and via other	Šurina, T.: Automatska regulacija, Školska knjiga, Zagreb, 1981.	1						
media)	M.B. Histand, D.G. Alciatore: Introduction to Mechatronics and Measurement Systems, McGraw Hill, 1999.		teacher/Internet					
	<ol> <li>Stančić, Guidelines for laboratory exercises, FESB</li> </ol>		e-learning portal					
	J. Musić: Authorized lecture notes, FESB		é-learning portal					
Optional literature (at the time of submission of study programme proposal)	2. Friedland, B.: Control System Design, McGraw 2. Sinclair, I.: Sensors and Transducers, 3 <sup>rd</sup> edition, N	r-Hill, New Yor Newnes, Oxfor	k, 1986. d, 2001.					
Quality assurance methods that ensure the acquisition of exit competences	<ul> <li>Keeping records of student attendance.</li> <li>Annual analysis of course statistics in terms of midterm and finals exams</li> <li>Feedback from students via surveys.</li> <li>Feedback from graduated students (or senior students) on course content relevance.</li> <li>Self-evaluation of teachers.</li> <li>Periodic institutional evolution of course teachers.</li> </ul>							
Other (as the proposer wishes to add)	/							

NAME OF THE COURSE	SIGNALS AND SYSTEMS							
Code	FELO05 Year of study 2.							
Course teacher	Petar Šolić, Ph.D., Assistant Professor	Credits (ECTS)	6					
Associate teachers	Matea Božić-Kudrić, mag. ing.	Type of instruction (number of hours)	L 45	S 0	AE 15	LE 15	DE 0	
Status of the course	Obligatory	Percentage of application of e-learning	0	•			Ŭ	
	COURSE	E DESCRIPTION	•					
Course objectives	Training students for: - Understanding and ap - Understanding the pro - Understanding the met	plying Fourier Transform ir blem of signal transmissio thods of optimal coding an	n signal n throu d throu	l proce gh rea gh noi	essing Il chan isy cha	nels Innels		
Course enrolment requirements and entry competences required for the course	Mathematics and Applied N	Mathematics and Applied Mathematics						
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<ul> <li>Students will be able to:</li> <li>1. Define and calculate Fourier transform of periodic and non-periodic signals</li> <li>2. Define and calculate correlation, autocorrelation and convolution</li> <li>3. Define linear systems</li> <li>4. Explain problems of transmission in real channels</li> <li>5. Define basic properties of random signals</li> <li>6. Apply optimal coding methods</li> <li>7. Explain transmission in noisy channels.</li> </ul>							
	Course content							
	Introduction About signals	and systems.			nours 3	nc	urs 1	
	Signals and their properties	s: speech, audio, video, da	ata, noi	se	3		1	
	Definition of Fourier transfo transform	orm. Basic properties of Fo	ourier		3		1	
	Symetric property of Fourier real functions. Correlation.	er transform. Fourier transf Autocorrelation. Convolut	orm of ion.		3		1	
	Linear systems. Impulse re Transmission in real chann	esponse. Transform function nels. Criteria of transmission	on. on quali	ty.	3		1	
	Periodic signals. Correlation signals. Convolution of per	in and autocorrelation of p iodic signals.	eriodic		3		1	
broken down in	variables. Spectral density	of random signals.			3		1	
class schedule	Analog/digital conversion.	m signals. Signal detection	n in nois em.	se.	3 2		1	
(syllabus)	Quantization. Coding Information source. Alphab	et capacity. Channel capa	icity. Se	elf-	3		1	
	Information. Entropy Coding. Optimal code. Bloc	ck coding. Shannon-Fano	coding		3		1	
	method. Huttman coding method. Joint events (memory-based information sources). Mutual information. Speech as memory-based information source. Capacity of noisy channels. Information transmission through noisy channels						1	
	List of laboratory exercises					LEI	nours	
	Fourier transform						2	
	Linear systems	tion					2	
	orrelation and autocorrelation 2							

L	Discrete Fourier transform 2						2	
F	PCM systems	CM systems 2						
(	Optimal coding							
	⊠ lectures			🗆 independen	t assignments			
	□ seminars and wor	kshops		multimedia				
Format of instruction	⊠ exercises			⊠ laboratory				
	<i>□on line</i> in entirety			$\square$ work with m	ventor			
	□ partial e-learning			□ (othe	r)			
	□ field work				• /			
Studentresponsibiliti es	The presence on lec Performed all require	tures in ed labor	the amo atory exe	unt of at least 7 rcises.	'0% of the times	schedu	lled.	
Screening student	Class attendance	2	Researc	h	Practical trainir	ng		
proportion of ECTS	Experimental work		Report		Individual work		2,7	
eachactivity so that	Essay		Seminal		Laboratory exe	rcises	0,5	
ECTS credits is	Tests	0,2	Oral exa	ım	Preparation for laboratory exer	cises	0,5	
value of the course)	Written exam	0,1	Project		(Other)			
Grading and evaluating student work in class and at the final exam	after 7 weeks of class students that did no questions and tasks student is required to The midterm and fin passing grade is 45% (if midterm have 2 ta points in task). The requirement for exercises. Grade (in percentage Grade (%) = 0,167 * M1, M2 – points at th laboratory (with com The final evaluation in percentage Rating 50% to 61% is suffic 62% to 74% good (3 75% to 87% of very 1 88% 100% Excellent Final exams consist The requirement for exam consists of 3 ta in tasks). Final exams are bein	ses and bt pass (5-6 que b have 7 hal exam % points sks and br pass e) is forn L + 0,83 he mid-te pleted a is detern ient (2) ) good (4 t (5) of 12 q passing sks and t (5)	second c the midi estions an 70% of its as are ca s on each I maximu ing grad med accc 33 * (0.5 erm expre- ill lab. Ex mined as ) uestions grade is I totally 30 according	and tasks (gen follows: and tasks (gen and tasks tasks) in class attendar rried out as wi midterm exam m of 20 points, e is the posit ording to the for * M1 + 0,5 * M2 essed as a pere follows: and tasks (gen 45% from tota points, it mean g to the exam s	eks of classes. Ir ike part. Mid-te n order to take a nce. itten tests. The n, with at least 2 then it means to tive assessmer mula: 2); centage, and L- ssed as a percer erally 9 question if number of give ns to achieve at chedule.	n the fina rm cons mid-ter require 0% of ta o have a nt of la - points ntage.	al exams sist of 8 m exam, ment for usks part to least 4 boratory from the 3 tasks). s (if final .5 points	
Deguired literature					Number of			
(available in the		Title	•		Number of copies in	Availat	oility via	
(available in the library and via other		Title	•		Number of copies in the library	Availat other	oility via media	
(available in the library and via other media)	H. Dujmić: Signali i s	Title sustavi,	FESB, ir	iterna skripta	Number of copies in the library	Availat other e-lea	<b>bility via</b> media	

submission of study programme proposal)	
Quality assurance methods that ensure the acquisition of exit competences	<ul> <li>Evaluation of results in accordance with the above learning outcomes</li> <li>Feedback from students via surveys</li> <li>Self-evaluation of teachers</li> <li>Feedback from students that already graduated, by taking their course usability notice</li> </ul>
Other (as the proposer wishes to add)	

NAME OF THE COURSE	PROFESSIONAL TRAINING										
Code	FEYY03	ľ	Year of s	tudy		3					
Course teacher	Head of the professi training from the Fac	onal culty	Credits (E	ECTS)		10					
Associate teachers	Head of the professi training from the priv institution	onal . ⁄ate	Type of ir (number	nstruction of hours	on s)	L	S	AE	LE	DE	
Status of the course	Mandatory	Vandatory Percentage of application of e-learning									
	CC	DURSE	DESCRI	PTION							
Course objectives	Training students for - consolidating complex eng - acquaintanc institution, - solving prac - inclusion in t - writing techr	<ul> <li>Training students for: <ul> <li>consolidating theoretical knowledge and practical skills in solving highly complex engineering problems</li> <li>acquaintance with the organization, work and business of the receiving institution,</li> <li>solving practical problems,</li> <li>inclusion in the labour market,</li> </ul> </li> </ul>									
Course enrolment requirements and entry competences required for the course	Acquired 120 ECTS	Acquired 120 ECTS credits									
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<ul> <li>Students will be able to:</li> <li>consolidate theoretical knowledge and practical skills in solving problems</li> <li>use literature, databases and other sources of information</li> <li>select appropriate methods and procedures for solving practical problems</li> <li>apply technical knowledge and skills to effectively solve engineering problems</li> <li>prepare a written report on the work results</li> </ul>										
Course content broken down in detail by weekly class schedule (syllabus)	Professional training receiving institution i the head of the profe professional training	is the in n accor essional from th	ndepende dance wi training f e Faculty	ent worl th the p from the	k of the s lan and e receivi	student prograr ng instit	perfor nme a tution a	med ir greed and th	n the betwe e heac	en 1 of	
Format of instruction	<ul> <li>□ lectures</li> <li>□ seminars and workshops</li> <li>□ exercises</li> <li>□ on line in entirety</li> <li>□ partial e-learning</li> <li>☑ field work</li> <li>☑ independent assignments</li> <li>□ multimedia</li> <li>□ laboratory</li> <li>☑ work with mentor</li> <li>□ (other)</li> </ul>										
Student responsibilities	Independent work										
Screening student work (name the	Class attendance		Researc	h		Practic	al trair	ning		7	
proportion of ECTS credits for each	Experimental work		Report			Indepe	ndent	work		2	
activity so that the	Essay		Semina essay	•		Report	writing	9		1	
ECTS credits is	Tests		Oral exa	am			(Other	)			
value of the course)	Written exam		Project				(Other	)			
Grading and evaluating student work in class and at the final exam	Professional training training in accordan Professional training	is not e ce with report.	evaluated the Reg Professi	. Studer ulation onal tra	nts are c on profe iining re	bliged tessiona	to com I traini validate	plete   ng an ed by	orofess d to w the he	sional rite a ad of	

	professional training from the receiving institution training from the Faculty.	and the head	l of professional
Required literature (available in the	Title	Number of copies in the library	Availability via other media
library and via other media)			
Optional literature (at the time of submission of study programme proposal)			
Quality assurance methods that ensure the acquisition of exit competences	<ul> <li>Questionnaire on professional training</li> <li>Self-evaluation of the head of professional training</li> <li>Student survey of the whole study programm</li> </ul>	aining ie	
Other (as the proposer wishes to add)			

NAME OF THE COURSE	FINAL THESIS									
Code	FEYY01		Year of s	tudy		3				
Course teacher			Credits (E	ECTS)		10				
Associate teachers			Type of instruction (number of hours)			L	S	AE	LE	DE
Status of the course	Mandatory		Percentage of							
	· · ·									
Course objectives	Training students for: <ul> <li>consolidating theoretical knowledge and practical skills in solving highly complex engineering problems</li> <li>being independent in solving problems under the given conditions</li> <li>writing and presenting the project results</li> </ul>									
Course enrolment requirements and entry competences required for the course	Acquired 120 ECTS	cquired 120 ECTS credits								
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<ul> <li>Students will be able to:</li> <li>consolidate theoretical knowledge and practical skills in solving problems</li> <li>use literature, databases and other sources of information</li> <li>select appropriate methods and procedures for solving practical problems</li> <li>apply technical knowledge and skills to effectively solve engineering problems</li> <li>give public presentation, to prepare written report and present project results</li> </ul>									
Course content broken down in detail by weekly class schedule (syllabus)	Final thesis is the independent work of the student produced according to the task and instructions given by the supervisor									
Format of instruction	<ul> <li>□ lectures</li> <li>□ seminars and workshops</li> <li>□ exercises</li> <li>□ on line in entirety</li> <li>□ partial e-learning</li> <li>□ field work</li> </ul>									
Student responsibilities	Independent work									
Screening student work (name the	Class attendance		Researc	h		Practic	al train	ing		
proportion of ECTS	Experimental work		Report			Individu	ual wor	k		10
activity so that the	Essay		Seminal essay	-			(Other)			
ECTS credits is	Tests		Oral exa	ım			(Other)			
equal to the ECTS value of the course)	Written exam		Project				(Other)			
Grading and evaluating student work in class and at the final exam	Final thesis is evalu during the process o	lated by	y the sup al thesis p	ervisor productio	based on and c	on the	studen en and	t's ac oral p	chiever resent	ments tation.
Required literature (available in the		Title	9			Num copi the li	ber of es in ibrary	Ava ot	ilabili her m	ty via edia

library and via other media)	Literature depends on the given problem. The literature list may be given by the supervisor or the student should find the appropriate literature to help solve the problem.
Optional literature (at the time of submission of study programme proposal)	
Quality assurance methods that ensure the acquisition of exit competences Other (as the proposer wishes to add)	<ul> <li>Self-evaluation of teachers</li> <li>Student survey of the whole study programme</li> </ul>

## 3. STUDY PERFORMANCE CONDITIONS

## 3.1. Places of the study performance

Buildings of the constituent part (name existing, under construction and planned buildings)	
Identification of building	FESB
Location of building	R. Boškovića 32
Year of completion	2008.
Total square area in m <sup>2</sup>	29.477

## 3.2. List of teachers and associate teachers

CODE	Course	Teachers and associate teachers
FELO16	Antennas	Antonio Šarolić, Ph.D., Full Professor Associate teachers: Anđela Matković, mag. ing. el.
FENO13	Application of Industrial Computers	Ozren Bego, Ph.D., Associate Professor Associate teachers: Danijel Jolevski, Ph.D., Assistant Professor
FEMY02	Applied Mathematics	Ivančica Mirošević, M.Sc., Lectuter Associate teachers: Lea Dujić
FELO06	Automation	Josip Musić, Ph.D., Assistant Professor Associate teachers: Ana Kuzmanić Skelin, Ph.D., Assistant Professor
FELO44	Biomechanics Practicum	Josip Musić, Ph.D., Assistant Professor Associate teachers: Tea Marasović, PhD
FEEE14	Commercial Law	Zlatko Ćesić, Ph.D., Assistant Professor
FELO10	Communication Systems	Matko Šarić, Ph.D., Assstant Professor Associate teachers: Petar Šolić, Ph.D., Assstant Professor
FELO31	Computer Aided Analysis of Radiating Structures	Vicko Dorić, Ph.D., Associate Professor Associate teachers: Maja Škiljo, Ph.D.
FELP16	Computer and Data Security	Julije Ožegović, Ph.D., Full Professor Associate teachers: Lada Sartori, Senior Lectuter, Vesna Pekić, Ph.D., Ante Kristic, Ph.D.
FELO22	Computer Architectures	Sven Gotovac, Ph.D., Full Professor Associate teachers: Dunja Gotovac
FELP08	Computer Networks	Julije Ožegović, Ph.D., Full Professor Associate teachers: Stipe Braica, Lecturer, Mario Mornar, Lecturer, Vesna Pekić, Ph.D., Ante Kristic, Ph.D.
FENO08	Control Engineering	Mateo Bašić, Ph.D., Associate Professor Associate teacher: M.Sc. Ivan Grgić
FENO17	Control of Electrical Drives	Mateo Bašić, Ph.D., Associate Professor
FELO18	Control System Design	Mojmil Cecić, Ph.D., Full Professor Associate teachers: Marko Lete, mag. ing.
FENO25	Design of Low Voltage Facilities	Marin Despalatović, Ph.D., Associate Professor

FELP17	Designing and Using Computer Networks	Julije Ožegović, Ph.D., Full Professor Associate teachers: Lada Sartori, Senior Lecturer, Vesna Pekić, Ph.D., Ante Kristic, Ph.D.
FELO11	Digital Techniques	Julije Ožegović, Ph.D., Full Professor Associate teachers: Stipe Braica,Lecturer, Vesna Pekić, Ph.D., Ante Kristic, Ph.D.
FENO12	Electrical Distribution Networks	Damir Jakus, Ph.D. Assistant Professor Josip Vasilj, Ph.D.
FENO09	Electrical Drives	Marin Despalatović, Ph.D., Associate Professor Associate teachers: Goran Majić, Ph.D
FENO10	Electrical Installations	Rino Lucić, Ph.D., Full Professor Associate teachers: Ante Veža, assistant
FENO04	Electrical Machines and Transformers	Ivica Jurić-Grgić, Ph.D., Associate Professor Dino Lovrić, Ph.D., Senior Research Assistant
FENO24	Electrical Measurements	Tomislav Kilić, Ph.D., Full Professor Associate teachers:Tonko Garma, Ph.D. Assistant Professor
FENO05	Electrical Networks	Petar Sarajčev, Ph.D., Associate Professor
FENO06	Electrical Power Switchgears	Tonći Modrić, Ph.D., Assistant Professor
FENO15	Electrical Safety	lvica Jurić-Grgić, Ph.D., Associate Professor
FELO21	Electromagnetic Compatibility	Vicko Dorić, Ph.D., Associate Professor Associate teachers: Maja Škiljo, Ph.D.
FELO27	Electronic Cad	Mojmil Cecić, Ph.D., Full Professor
FELO04	Electronic Circuits	Spomenka Bovan, M.Sc., Senior Lectuter Associate teachers: Ivan Marasović, Ph.D., Assistant Professor
FELO47	Electronic Circuits Design	Ivan Marinović, Ph.D. Full Professor Associate teachers: Duje Čoko, Ph.D.
FENO21	Electronic Converters for Power Supplies	Dinko Vukadinović, Ph.D., Full Professor Associate teachers: Mateo Bašić, Ph.D. Assistant Professor Ivan Grgić, Assistant
FELO42	Electronic Devices	Spomenka Bovan, M.Sc., Senior Lectuter
FELO20	Electronic Instrumentation	Ivan Marasović, Ph.D. Assistant Professor
FELO01	Electrotechnical Materials and Technologies	Josip Lörincz, Ph. D., Associate professor
FELO29	Elements of Robotics	Mirjana Bonković, Ph.D., Full Professor Associate teachers: Miroslav Dujmović, BSc (external collaborator)
FENO23	Energy Sources	Elis Sutlović, Ph.D., Full Professor Associate teachers: Marin Mandić, Assistant
FEOO02	English Language 1	Mira Braović Plavša, senior lecturer
FEOO03	English Language 2	Mira Braović Plavša senior lecturer
FENO01	Fundamentals of Electrical Engineering 1	Tomislav Kilić, Ph.D., Full Professor Associate teachers: Nedjeljka Grulović-Plavljanić, M.Sc., Senior Lectuter
FENO28	Fundamentals of Electrical Engineering 2	Silvestar Šesnić, Ph.D., Assistant Professor
FENO19	High Voltage Engineering	Petar Sarajčev, Ph.D., Associate Professor
FELO41	High-Frequency Electronics	Ivan Marinović, Ph.D. Full Professor
FELO32	Human Exposure to Electromagnetic Radiation	Vicko Dorić, Ph.D., Associate Professor Associate teachers: Anna Šušnjara, Assistant

FETO01	Hydraulic and pneumatic systems	Jani Barle, Ph.D., Full Professor
FENO31	Instrumentation for Smart Grid	Alen Kovac Goran Petrović, Ph.D., Associate Processor Associate teachers: Juraj Alojzije Bosnić, assistant
FELO35	Internet Programming	Ljiljana Šerić, Ph.D., Assistant Professor Associate teachers: Marin Bugarić, Ph.D., Senior Research Assistant Andrija Sommer, mag ing
FESY01	Introduction to Computer Applications	Goran Petrović, Ph.D., Associate Professor Associate teachers: Josip Vasilj, Ph.D.
FESY03	Introduction to Entrepreneurship	Marija Šiško Kuliš, Ph.D., Associate Professor
FELO02	Introduction to Programming	Ljiljana Šerić, Ph.D., Assistant Professor Associate teachers: Marin Bugarić, Ph.D., Senior Research
FENO18	Maintenance and Testing of Electrical Power Equipment	Božo Terzić, Ph.D., Full Professor Associate teachers: Goran Majić, Ph.D.
FENO26	Marine Electrical Engineering	Slavko Vujević, Ph.D., Full Professor
FELO40	Maritime Radiocommunications	Antonio Šarolić, Ph.D., Full Professor Associate teachers: Niko Ištuk, mag. ing. el
FEMY03	Mathematics	Ivančica Mirošević, M.Sc., Lectuter Associate teachers: Lea Dujić, Marija Čatipović, Marina Mandić
FENO11	Measurements in Power System	Goran Petrović, Ph.D., Associate Professor Associate teachers: Juraj Alojzije Bosnić, assistant; Tonko Garma, Ph.D., Assistant Professor
FENO16	Measurements of Process Quantities	Goran Petrović, Ph.D., Associate Professor Associate teachers: Juraj Alojzije Bosnić, assistant
FELO48	Mechatronics Practicals	Vladan Papić, Ph.D., Full Professor Mirjana Bonković, Ph.D., Full Professor Associate teachers: Miroslav Dujmović, BSc (external collaborator)
FELO39	Microcontrollers and embedded network systems	Ivo Stančić, Ph.D., Assistant Professor
FENO30	Microprocessors	Ozren Bego, Ph.D., Associate Professor Associate teachers: Danijel Jolevski, Ph.D., Assistant Professor
FELO37	Mobile Communication Networks	Dinko Begušić, Ph.D., Full Professor Associate teachers: Maja Stella, Ph.D., Assistant Professor Marina Rajič, Mag. ing. Josip Žilić, Magl. ing. Ante Dagelić, Mag. Ing,
FELO23	Modelling and Simulation	Jadranka Marasović, Ph.D., Full Professor Mojmil Cecić, Ph.D., Full Professor Associate teachers: Marko Lete, mag. ing.
FELO19	Multimedia	Mladen Russo, Ph.D., Associate Professor Associate teachers: mag. ing. Matija Pauković, Assistant mag. ing. Jelena Čulić-Gambiroža mag. ing. Martina Bašić
FELO45	Optical Communications	Dinko Begušić, Ph.D., Full Professor Associate teachers: Maja Stella, Ph.D., Assistant Professor

		Maja Stella, Ph.D., Assistant Professor
		Ivica Meštrović, dipl. ing.
		Marko Banović, dipl. ing.
		Josip Babić, Mag. Ing,.
FELO07	Basic of Optoelectronics	Tihomir Betti, Ph.D., Assistant Professor
FEMO01	Physics	Ivica Sorić, senior lecturer
FENO07	Power Electronics	Dinko Vukadinović, Ph.D., Full Professor Associate teachers: Mateo Bašić, Ph.D. Assistant Professor Ivan Grgić, Assistant
FENO22	Power System and Environment	Tonći Modrić, Ph.D., Assistant Professor
		Mate Dabro, Ph.D., Assistant Professor
FELO33	Practicum in Digital Image Processing	Mirjana Bonković, Ph.D., Full Professor Associate teachers: Ana Kuzmanić Skelin, Ph.D., Assistant Professor
FELO46	Practicum in Electromagnetic Simulations	Antonio Šarolić, Ph.D., Full Professor Associate teachers: Niko Ištuk, mag. ing. el
ххх	Praktikum iz elektromagnetskih simulacija	Associate teachers:
FELO12	Process Control	Darko Stipaničev, Ph.D., Full Professor
FENO14	Protection and Control Systems in Substation	Elis Sutlović, Ph.D., Full Professor Associate teachers: Tonći Modrić, Ph.D., Assistant Professor
FENO20	Protection at Substations	Petar Sarajčev, Ph.D., Associate Professor Associate teachers:
FELO30	Radio Communications	Zoran Blažević, Ph.D., Full Professor Associate teachers: Maja Škiljo, Ph.D.
FENO29	Renewable Energy Sources	Damir Jakus, Ph.D. Assistant Professor Associate teachers: Josip Vasilj, Ph.D.
FELO36	Sensors and Transducers	Josip Musić, Ph.D., Assistant Professor Associate teachers: Ivo Stančić, Ph.D., Assistant Professor
FELO05	Signals and Systems	Petar Šolić, Ph.D., Assistant Professor Associate teachers: Matea Božić-Kudrić, mag. ing.
FEYY03	Professional Training	
FEYY01	Final Thesis	

First and last name and title of	Jani Barle, Ph.D., Full Professor	
The course be/she teaches in the		
proposed study programme	Hydraulic and pneumatic systems	
GENERAL INFORMATION ON COURSE TEACHER		
Address	Žnjanska 4, 21000 Split, HR a	
Telephone number	+385 (21) 305930	
E-mail address	Jani.Barle@fesb.hr	
Personal web page	https://nastava.fesb.hr/nastava/nastavnici/detalji/barle	
Year of birth	1964	
Scientist ID	186172	
Research or art rank, and date of	Scientific Adviser, May 2011.	
last rank appointment		
Research-and-teaching, art-and-		
teaching or teaching rank, and date	Senior Full Professor, September 2016.	
of last rank appointment		
Area and field of election into	Mechanical engineering, mechanical construction engineering	
	OVMENT	
	LUNIVIENT	
Institution where employed	Engineering and Naval Architecture	
Date of employment	July 1991.	
Name of position (professor,	Professor	
researcher, associate teacher, etc.)	PTOTESSOI	
Field of research	Process Automation, System Maintenance Management	
Function	Education and research	
INFORMATION ON EDUCATION – F	lighest degree earned	
Degree	Ph.D.	
Institution	University of Zagreb, Faculty of Mechanical Engineering and Naval Architecture	
Place	HR - Zagreb	
Date	January 1998.	
INFORMATION ON ADDITIONAL TRAINING		
Year	1996.	
Place	IT - Padua	
Institution	Dipartimento di Ingegneria Meccanica	
Field of training	Research on experimental methods	
MOTHER TONGUE AND FOREIGN	ANGUAGES	
Mother tongue	Croatian	
Foreign language and command of		
foreign language on a scale from 2	English - 5	
(sufficient) to 5 (excellent)		
Foreign language and command of		
foreign language on a scale from 2	German - 3	
(sufficient) to 5 (excellent)		
Foreign language and command of		
foreign language on a scale from 2	Italian - 3	
COMPETENCES FOR THE COURSE		
	On Faculty of Electrical Engineering, Mechanical Engineering and	
Farlier experience as course	Indergraduate study:	
teacher of similar courses (name	- Industrial process control (FETCO6)	
title of course study programme	Master's degree study:	
where it is/was offered and level of	- Hydraulics and pneumatics(FETI 17)	
study programme)	- Maintenance management (FETL04)	
	- Product life management (FETM06)	
	Doctorate degree study:	

## 3.3. Curriculum vitae of the course teacher

	- Experimental methods (FETU24)	
Authorship of university/faculty	Barle J: Hydraulics and pneumatics (student handbook and	
textbooks in the field of the course	workbook in Croatian: <i>Hidraulika i pneumatika</i> ). FESB. Split. 2010.	
Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)	<ol> <li>Barle, Jani; Đukić, Predrag; Ban, Dario.</li> <li>Verification of Number of Cycles for Fatique Life Estimation of Wind-Sensitive Structures // 7th ICCSM / Croatian Society of Mechanics, 2012. 233-234.</li> <li>Barle, Jani; Wolf, Hinko; Đukić, Predrag.</li> <li>Experimental verification of the dynamic model for a wind turbine tower // 30th Danubia-Adria: Symposium on Advances in Experimental Mechanics / Croatian Society of Mechanics, 2013.</li> <li>219-220</li> <li>Grubišić, Vatroslav; Barle, Jani.</li> <li>Procedure for the Service Strength Approval of the Drillship Derricks. // Rad Hrvatske akademije znanosti i umjetnosti.</li> <li>Tehničke znanosti. 521 (2015), 17; 51-62.</li> <li>Đukić, Predrag; Wolf, Hinko; Jani, Barle.</li> <li>Simple dynamic model of wind turbine tower with experimental verification. // International journal for engineering modelling. 28 (2015), 1-4; 49-59</li> </ol>	
Professional and scholarly articles published in the last five years in subjects of teaching methodology and teaching quality (5 works at most)	<ol> <li>Barle, Jani; Franulović, Marina; Jurčević Lulić, Tanja; Kladarić, Ivica; Markučič, Damir; Radica, Gojmir. <i>Izrada kataloga znanja,</i> <i>vještina i kompetencija za studije strojarstva u Republici Hrvatskoj</i> // Zbornik radova međunarodne stručne konferencije ME4CataLOgue / Kozak, D., Barle, J., Markučič, D., Pavletić, D., Matičević, G, Vranešević M. N., Rosandić, Ž, Damjanović, D. (ur.)., Sl.Brod 2015.</li> <li>"<i>Hrvatski katalog znanja, vještina i kompetencija za studije</i> <i>strojarstva zasnovan na ishodima učenja (za preddiplomski,</i> <i>diplomski i doktorski studij)</i>", Strojarski fakultet u Slavonskom Brodu Sveučilišta J. J. Strossmayera u Osijeku, 2015., Kozak, D., Barle, J., Boras, I., Franulović, M., Jurčević-Lulić, T., Kladarić, I., Lelas, D., Markučić, D., Matičević, G., Pavletić, D., Vranešević- Marinić, N.(ur.). ISBN 978-953-6048-78-6</li> </ol>	
Professional, science and artistic projects in the field of the course carried out in the last five years (5 at most)		
The name of the programme and the volume in which the main teacher passed exams in/acquired the methodological-psychological- didactic-pedagogical group of competences?-pedagoške kompetencije?	IPA IV project ME4CataLOgue "Further development and implementation of the Croatian Qualifications Framework (CQF)", 2013-2015.	
PRIZES AND AWARDS, STUDENT EVALUATION		
Prizes and awards for teaching and scholarly/artistic work		
Results of student evaluation taken in the last five years for the course that is comparable to the course described in the form (evaluation organizer, average grade, note on grading scale and course evaluated)		

First and last name and title of teacher	Mateo Bašić, Ph.D., Assistant Professor	
The course he/she teaches in the	Control Engineering	
proposed study programme	Control of Electrical Drives	
GENERAL INFORMATION ON COURSE TEACHER		
Address	141. brigade 24, 21000 Split, HR	
Telephone number	+385 21 305 615	
E-mail address	mabasic@fesb.hr	
Personal web page		
Year of birth	1982	
Scientist ID	306926	
last rank appointment	Senior Scientific Associate, 4/11/2016	
Research-and-teaching art-and-		
teaching or teaching rank, and	Assistant Professor, 19/3/2014	
date of last rank appointment		
Area and field of election into	Technical Sciences, Electrical engineering	
research or art rank		
INFORMATION ON CURRENT EMP	PLOYMENT	
Institution where employed	Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture	
Date of employment	1/6/2008	
Name of position (professor	1/0/2000	
researcher, associate teacher.	Professor	
etc.)		
Field of research	Power Engineering (Power Electronics, Control of Electrical	
	Machines)	
Function		
INFORMATION ON EDUCATION –	Highest degree earned	
Degree	PhD	
Institution	Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture	
Place	Snlit	
Date	13/2/2023	
INFORMATION ON ADDITIONAL T	RAINING	
Year		
Place		
Institution		
Field of training		
MOTHER TONGUE AND FOREIGN	LANGUAGES	
Mother tongue	Croatian	
Foreign language and command of		
foreign language on a scale from 2	English, 4	
(sufficient) to 5 (excellent)		
Foreign language and command of		
(sufficient) to 5 (excellent)		
Foreign language and command of		
foreign language on a scale from 2		
(sufficient) to 5 (excellent)		
COMPETENCES FOR THE COURS	E	
Earlier experience as course		
teacher of similar courses (name		
title of course, study programme		
where it is/was offered, and level		
of study programme)		

Authorship of university/faculty	
Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)	<ol> <li>Bašić, M., Vukadinović, D. "Online Efficiency Optimization of a Vector Controlled Self-Excited Induction Generator", IEEE Transactions on Energy Conversion. 31 (2016), 1; 373-380</li> </ol>
	<ol> <li>Vukadinović, D., Bašić, M., Nguyen, C.H., Vu, N.L., Nguyen, T.D., "Hedge-Algebra-Based Voltage Controller for a Self- Excited Induction Generator", <i>Control</i> <i>engineering practice</i>, 30 (2014); 78-90</li> </ol>
	<ol> <li>Bašić, M., Vukadinović, D., "Vector control system of a self- excited induction generator including iron losses and magnetic saturation", <i>Control engineering practice</i>, 21 (2013), 4; 395-406</li> </ol>
	<ol> <li>Bašić, M., Vukadinović, D., Petrović, G., "Dynamic and Pole-Zero Analysis of Self-Excited Induction Generator Using a Novel Model with Iron Losses", <i>International</i> <i>journal of electrical power &amp; energy systems</i>, 42 (2012), 1; 105-118</li> </ol>
	<ol> <li>Bašić, M., Vukadinović, D., Polić, M., "Analysis of Power Converter Losses in Vector Control System of a Self– Excited Induction Generator", <i>Journal of Electrical</i> <i>Engineering - Elektrotechnický časopis</i>, 65 (2014), 2; 65- 74</li> </ol>
Professional and scholarly articles published in the last five years in subjects of teaching methodology and teaching quality (5 works at most)	
Professional, science and artistic projects in the field of the course carried out in the last five years (5 at most)	
The name of the programme and the volume in which the main teacher passed exams in/acquired	
the methodological-psychological- didactic-pedagogical group of competences?	
PRIZES AND AWARDS, STUDENT	EVALUATION
Prizes and awards for teaching	
Results of student evaluation taken	
in the last five years for the course	
that is comparable to the course	
organizer, average grade note on	
grading scale and course	
evaluated)	

First and last name and title of teacher	Ozren Bego, Ph.D., Associate Professor	
The course he/she teaches in the	Application of Industrial Computers	
proposed study programme	Microprocessors	
GENERAL INFORMATION ON COL	IRSE TEACHER	
Address	Trondheimska 4C, 21000 Split, Croatia	
Telephone number	+385 21 305605	
F-mail address	obego@fesh.hr	
Personal web page		
Year of hirth	1966	
Scientist ID	186161	
Research or art rank, and date of		
last rank appointment	Research Scientist, November 2017.	
Research-and-teaching art-and-		
teaching or teaching rank and	Associate Professor December 2017	
date of last rank appointment		
Area and field of election into		
research or art rank	I ecnnical Sciences, Field Automation and Robotics	
INFORMATION ON CURRENT EMP	PLOYMENT	
	Faculty of Electrical Engineering, Mechanical Engineering and	
Institution where employed	Naval Architecture	
Date of employment	1991.	
Name of position (professor.		
researcher, associate teacher.	Associate Professor	
etc.)		
Field of research	Automation, Digital Control Systems	
Function		
INFORMATION ON EDUCATION -	Highest degree earned	
Degree	PhD	
Institution	Faculty of Electrical Engineering and Computing	
Place	Zagreb	
Date	24 2 2005	
INFORMATION ON ADDITIONAL T	RAINING	
Year		
Place		
Institution		
Field of training		
MOTHER TONGLIE AND FOREIGN		
Mother tongue	Croatian	
Foreign language and command of		
foreign language on a scale from 2	English (4)	
(sufficient) to 5 (excellent)		
Foreign language and command of		
foreign language on a scale from 2		
(sufficient) to 5 (excellent)		
Foreign language and command of		
foreign language on a scale from 2		
(sufficient) to 5 (excellent)		
COMPETENCES FOR THE COURSE		
Earlier experience as course		
teacher of similar courses (name	Elemente of industrial automotion. L'independente atuation	
title of course, study programme	Electrical Engineering and Information Technology	
where it is/was offered, and level	Lieuniai Engineening and miormation Teurnology.	
of study programme)		
Authorship of university/faculty		
textbooks in the field of the course		
Professional, scholarly and artistic	Jolevski, Danijel; Bego, Ozren; Sarajcev, Petar: Control	
articles published in the last five	structure design and dynamics modelling of the organic	

years in the field of the course (5 works at most)	<ul> <li>Rankine cycle system // Energy (Oxford). 121 (2017) ; 193-204.</li> <li>Jolevski, Danijel; Bego, Ozren. Model predictive control of gantry/bridge crane with anti-sway algorithm. // Journal of mechanical science and technology. 29 (2015) , 2; 827-834</li> <li>Jolevski, Danijel; Bego, Ozren; Grgat, Frano. GA Optimized AVR Controller with Higher Degree of Freedom of Tuning of Wanted Response. // International Review of Automatic Control (IREACO). 8 (2015) , 1; 72-79</li> </ul>
Professional and scholarly articles published in the last five years in subjects of teaching methodology and teaching quality (5 works at most)	
Professional, science and artistic projects in the field of the course carried out in the last five years (5 at most)	Nacional research project: Safer and more efficient cogeneration / trigeneration plants, 20152016., project financed from the EU fond. Development project: Control system for small hydro power plants, project leader, 20102017., project realized for Sintaksa d.o.o.
The name of the programme and the volume in which the main teacher passed exams in/acquired the methodological-psychological- didactic-pedagogical group of competences?-pedagoške kompetencije?	
PRIZES AND AWARDS, STUDENT	EVALUATION
Prizes and awards for teaching and scholarly/artistic work	
Results of student evaluation taken in the last five years for the course that is comparable to the course described in the form (evaluation organizer, average grade, note on grading scale and course evaluated)	

First and last name and title of teacher	Dinko Begušić, Ph.D., Full Professor	
The course he/she teaches in the proposed study programme	Mobile communication networks, Optical communications	
GENERAL INFORMATION ON COL	IRSE TEACHER	
Address	Trondheimska 4d, Split	
Telephone number	021305637	
E-mail address	begusic@fesb.hr	
Personal web page	www.fesb.hr/~begusic	
Year of birth	1960.	
Scientist ID	129685	
Research or art rank, and date of last rank appointment	Scientific advisor, scientific field of electrical engineering Scientific advisor, scientific field of computing	
Research-and-teaching, art-and- teaching or teaching rank, and date of last rank appointment	Full professor, permanent position (date of election Spetember 11, 2008)	
Area and field of election into research or art rank	Scientific area of technical sciences, scientific field of electrical engineering Scientific area of technical sciences, scientific field of computing	
INFORMATION ON CURRENT EMP	PLOYMENT	
Institution where employed	University of Split, Faculty of electrical engineering, mechanical engineering and naval architecture	
Date of employment	1985.	
Name of position (professor, researcher, associate teacher, etc.)	Full professor, permanent position	
Field of research	Information and communication technology, Telecommunications and informatics, Information processing, Networking technologies, Digital signal processing	
Function	Chair of communication technologies and signal processing	
INFORMATION ON EDUCATION -	Highest degree earned	
Degree	PhD	
Institution	University of Zagreb, Faculty of electrical engineering and computing	
Place	Zagreb	
Date	1992.	
INFORMATION ON ADDITIONAL TRAINING		
Year	1990.	
Place	Bruxelles, Belgija	
Institution	Universite Libre de Bruxelles	
Field of training	Telecommunications and informatics, Digital signal processing	
Year	1992.	
Place	London	
Institution	King's College London	
Field of training	Telecommunications and informatics, Digital signal processing	
Year	1998.	
Place	Dallas, SAD	
Institution	University of Texas at Dallas	
Field of training	Telecommunications and informatics, Digital signal processing	
MOTHER TONGUE AND FOREIGN	LANGUAGES	
Mother tongue	Croatian	

Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	English, 5
COMPETENCES FOR THE COURS	SE
Earlier experience as course teacher of similar courses (name title of course, study programme where it is/was offered, and level of study programme)	Wireless communication networks, Optical communication systems, Transmission systems, Software engineering in telecommunications, (master study of electrical engineering)
Authorship of university/faculty textbooks in the field of the course	<ul> <li>D.Begušić: "Mobile communication networks ", handouts, 2016.</li> <li>D.Begušić: "Optical communications ", handouts, 2014.</li> <li>D.Begušić: "Programsko inženjerstvo u telekomunikacijama", nastavni tekst, 2004.</li> <li>N.Rožić, D.Begušić, M.Vrdoljak, W.Afrić:"New communication technologies ", ISBN 953-6114-20-8, FESB Split - HT-TKC Split, pp. 416, Split, 1999.</li> </ul>
Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)	T.Perković, M.Čagalj, T.Mastelić,N.Saxena, D.Begušić: "Secure Initialization of Multiple Constrained Wireless Devices for an Unaided User", IEEE Transactions on Mobile Computing (1536-1233) 11 (2012), 2; pp.337-351
	M. Stella, M. Russo, D. Begušić: "RF Localization in Indoor Environment", Radioengineering, Special issue on advanced RF measurements (ISSN 1210-2512), Vol 21, No. 2, 2012, pp. 557-567
	Josip Lorincz, Antonio Capone, Dinko Begušić, "Optimized Network Management for Energy Savings of Wireless Access Networks", Computer Networks Journal (ISSN: 1389-1286), svezak 55, broj 3, February 2011, str.: 626-648
	Josip Lorincz, Antonio Capone, Dinko Begušić, " <i>Heuristic</i> <i>Algorithms for Optimization of Energy Consumption in</i> <i>Wireless Access Networks</i> ", KSII Transactions on Internet and Information Systems (ISSN: 1976-7277), svezak 5, broj 5, April 2011., str.: 514-540
	D.Begušić, N.Rožić, H.Dujmić: "Development of the communication/information infrastructure at the academic institution", Computer Communications, Elsevier, ISSN 0140-3664, No.26, pp. 472-476, 2003.
Professional and scholarly articles published in the last five years in subjects of teaching methodology and teaching quality (5 works at most)	T.Kilić, I.Puljak, D.Begušić: "Studying electrical engineering and information technology at the University of Split, Croatia", International Journal of Electrical Engineering Education, Manchester University Press, ISSN 0020-7209, Vol. 44, No. 2; pp.175-183, Manchester, UK, 2007.
	D.Begušić, B.Bilić, T.Kilić, I.Puljak:" <i>Bolonjski proces na Fakultetu elektrotehnike, strojarstva i brodogradnje u Splitu</i> ", Zbornik sažetaka Obrazovanje inženjera Bolonjski proces 3 godine kasnije, Hrvatska akademija tehničkih znanosti, pp.38-39, Zagreb, 2007.
Professional, science and artistic	Advanced networking technologies and systems, project FESB
projects in the field of the course carried out in the last five years (5	Advanced heterogeneous networking technologies, project MZOS
at most)	Collaborative internationalization of software engineering in Croatia j, project TEMPUS

	Research in the area fo telecommunications, joint project FESB - Ericsson Nikola Tesla
	International conference on Software, Telecommunications and Computer Networks SoftCOM
	Journal of Communications Software and Systems
The name of the programme and the volume in which the main teacher passed exams in/acquired the methodological-psychological- didactic-pedagogical group of competences?-pedagoške kompetencije?	
PRIZES AND AWARDS, STUDENT	EVALUATION
Prizes and awards for teaching and scholarly/artistic work	Member of Croatian academy of engineering, Department of Information systems
Results of student evaluation taken in the last five years for the course that is comparable to the course described in the form (evaluation organizer, average grade, note on grading scale and course evaluated)	

First and last name and title of teacher	Tihomir Betti, Ph.D., Assistant Professor
The course he/she teaches in the proposed study programme	Optoelectronics
GENERAL INFORMATION ON COL	IRSE TEACHER
Address	Kaštelanska 2, HR-21000, Split
Telephone number	091 4305 889
E-mail address	betti@fesb.hr
Personal web page	
Year of birth	1977
Scientist ID	248722
Research or art rank, and date of	Assistant research follow 22 11 2012
last rank appointment	
Research-and-teaching, art-and-	
teaching or teaching rank, and	Assistant professor, 18.09.2013.
date of last rank appointment	
Area and field of election into	Technical sciences, electrical engineering
research or art rank	
	LOYMENI
Institution where employed	Faculty of Electrical Engineering, Mechanical Engineering and
Date of employment	08.06.2001.
Name of position (professor,	Assistant professor
researcher, associate teacher,	Assistant professor
Eicld of research	Electronica Nancelectronica Bhotovelteica
Fleid of research	
	Highest degree corned
INFORMATION ON EDUCATION -	righest degree earned
Degree	DhD
Degree	PhD Eaculty of Electrical Engineering, Mechanical Engineering and
Degree Institution	PhD Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture
Degree Institution Place	PhD Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture
Degree Institution Place Date	PhD Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture Split 04.12.2009.
Degree Institution Place Date INFORMATION ON ADDITIONAL T	PhD Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture Split 04.12.2009. RAINING
Degree Institution Place Date INFORMATION ON ADDITIONAL TI Year	PhD Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture Split 04.12.2009. RAINING 2013 (7 weeks)
Degree Institution Place Date INFORMATION ON ADDITIONAL TI Year Place	PhD Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture Split 04.12.2009. RAINING 2013. (7 weeks) Freiburg, Germany
Degree Institution Place Date INFORMATION ON ADDITIONAL TI Year Place Institution	PhD Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture Split 04.12.2009. RAINING 2013. (7 weeks) Freiburg, Germany Fraunhofer ISE
Degree Institution Place Date INFORMATION ON ADDITIONAL TI Year Place Institution Field of training	PhD Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture Split 04.12.2009. RAINING 2013. (7 weeks) Freiburg, Germany Fraunhofer ISE Photovoltaics
Degree Institution Place Date INFORMATION ON ADDITIONAL TI Year Place Institution Field of training Year	PhD Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture Split 04.12.2009. RAINING 2013. (7 weeks) Freiburg, Germany Fraunhofer ISE Photovoltaics 2011. (3 weeks)
Degree Institution Place Date INFORMATION ON ADDITIONAL TI Year Place Institution Field of training Year Place	PhD Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture Split 04.12.2009. RAINING 2013. (7 weeks) Freiburg, Germany Fraunhofer ISE Photovoltaics 2011. (3 weeks) Ljubljana, Slovenia
Degree Institution Place Date INFORMATION ON ADDITIONAL T Year Place Institution Field of training Year Place Institution	PhD Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture Split 04.12.2009. RAINING 2013. (7 weeks) Freiburg, Germany Fraunhofer ISE Photovoltaics 2011. (3 weeks) Ljubljana, Slovenia Institute "Jožef Stefan"
Degree Institution Place Date INFORMATION ON ADDITIONAL TI Year Place Institution Field of training Year Place Institution Field of training	PhD         Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture         Split         04.12.2009.         RAINING         2013. (7 weeks)         Freiburg, Germany         Fraunhofer ISE         Photovoltaics         2011. (3 weeks)         Ljubljana, Slovenia         Institute "Jožef Stefan"         Hybrid polymer solar cells
Degree Institution Place Date INFORMATION ON ADDITIONAL TI Year Place Institution Field of training Year Place Institution Field of training Year	PhD         Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture         Split         04.12.2009.         RAINING         2013. (7 weeks)         Freiburg, Germany         Fraunhofer ISE         Photovoltaics         2011. (3 weeks)         Ljubljana, Slovenia         Institute "Jožef Stefan"         Hybrid polymer solar cells         2007-2009. (several visits, 4 weeks in total)
Degree Institution Place Date INFORMATION ON ADDITIONAL TI Year Place Institution Field of training Year Place Institution Field of training Year Place Place	PhD Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture Split 04.12.2009. RAINING 2013. (7 weeks) Freiburg, Germany Fraunhofer ISE Photovoltaics 2011. (3 weeks) Ljubljana, Slovenia Institute "Jožef Stefan" Hybrid polymer solar cells 2007-2009. (several visits, 4 weeks in total) Munich, Germany
Degree Institution Place Date INFORMATION ON ADDITIONAL T Year Place Institution Field of training Year Place Institution Field of training Year Place Institution Field of training Year Place Institution	PhD Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture Split 04.12.2009. RAINING 2013. (7 weeks) Freiburg, Germany Fraunhofer ISE Photovoltaics 2011. (3 weeks) Ljubljana, Slovenia Institute "Jožef Stefan" Hybrid polymer solar cells 2007-2009. (several visits, 4 weeks in total) Munich, Germany Walter Schottky Institute
Degree Institution Place Date INFORMATION ON ADDITIONAL T Year Place Institution Field of training	PhD Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture Split 04.12.2009. RAINING 2013. (7 weeks) Freiburg, Germany Fraunhofer ISE Photovoltaics 2011. (3 weeks) Ljubljana, Slovenia Institute "Jožef Stefan" Hybrid polymer solar cells 2007-2009. (several visits, 4 weeks in total) Munich, Germany Walter Schottky Institute Application of semiconductor nanostructures in third
Degree Institution Place Date INFORMATION ON ADDITIONAL T Year Place Institution Field of training Year Place Institution Field of training Year Place Institution Field of training Year Place	PhD         Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture         Split         04.12.2009. <b>RAINING</b> 2013. (7 weeks)         Freiburg, Germany         Fraunhofer ISE         Photovoltaics         2011. (3 weeks)         Ljubljana, Slovenia         Institute "Jožef Stefan"         Hybrid polymer solar cells         2007-2009. (several visits, 4 weeks in total)         Munich, Germany         Walter Schottky Institute         Application of semiconductor nanostructures in third         generation photovoltaics
Degree Institution Place Date INFORMATION ON ADDITIONAL TI Year Place Institution Field of training MOTHER TONGUE AND FOREIGN	PhD         Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture         Split         04.12.2009.         RAINING         2013. (7 weeks)         Freiburg, Germany         Fraunhofer ISE         Photovoltaics         2011. (3 weeks)         Ljubljana, Slovenia         Institute "Jožef Stefan"         Hybrid polymer solar cells         2007-2009. (several visits, 4 weeks in total)         Munich, Germany         Walter Schottky Institute         Application of semiconductor nanostructures in third         generation photovoltaics         LANGUAGES
Degree Institution Place Date INFORMATION ON ADDITIONAL TI Year Place Institution Field of training MOTHER TONGUE AND FOREIGN Mother tongue	PhD         Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture         Split         04.12.2009.         RAINING         2013. (7 weeks)         Freiburg, Germany         Fraunhofer ISE         Photovoltaics         2011. (3 weeks)         Ljubljana, Slovenia         Institute "Jožef Stefan"         Hybrid polymer solar cells         2007-2009. (several visits, 4 weeks in total)         Munich, Germany         Walter Schottky Institute         Application of semiconductor nanostructures in third         generation photovoltaics         LANGUAGES         Croatian
Degree Institution Place Date INFORMATION ON ADDITIONAL T Year Place Institution Field of training MOTHER TONGUE AND FOREIGN Mother tongue Foreign language and command of	PhD Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture Split 04.12.2009. RAINING 2013. (7 weeks) Freiburg, Germany Fraunhofer ISE Photovoltaics 2011. (3 weeks) Ljubljana, Slovenia Institute "Jožef Stefan" Hybrid polymer solar cells 2007-2009. (several visits, 4 weeks in total) Munich, Germany Walter Schottky Institute Application of semiconductor nanostructures in third generation photovoltaics LANGUAGES Croatian
Degree Institution Place Date INFORMATION ON ADDITIONAL T Year Place Institution Field of training MOTHER TONGUE AND FOREIGN Mother tongue Foreign language and command of foreign language on a scale from 2	PhD         Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture         Split         04.12.2009.         RAINING         2013. (7 weeks)         Freiburg, Germany         Fraunhofer ISE         Photovoltaics         2011. (3 weeks)         Ljubljana, Slovenia         Institute "Jožef Stefan"         Hybrid polymer solar cells         2007-2009. (several visits, 4 weeks in total)         Munich, Germany         Walter Schottky Institute         Application of semiconductor nanostructures in third         generation photovoltaics         LANGUAGES         Croatian         English, 5
Degree Institution Place Date INFORMATION ON ADDITIONAL T Year Place Institution Field of training MOTHER TONGUE AND FOREIGN Mother tongue Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	PhD         Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture         Split         04.12.2009.         RAINING         2013. (7 weeks)         Freiburg, Germany         Fraunhofer ISE         Photovoltaics         2011. (3 weeks)         Ljubljana, Slovenia         Institute "Jožef Stefan"         Hybrid polymer solar cells         2007-2009. (several visits, 4 weeks in total)         Munich, Germany         Walter Schottky Institute         Application of semiconductor nanostructures in third generation photovoltaics         LANGUAGES         Croatian         English, 5
Degree         Institution         Place         Date         INFORMATION ON ADDITIONAL TI         Year         Place         Institution         Field of training         MOTHER TONGUE AND FOREIGN         Mother tongue         Foreign language and command of	PhD         Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture         Split         04.12.2009.         RAINING         2013. (7 weeks)         Freiburg, Germany         Fraunhofer ISE         Photovoltaics         2011. (3 weeks)         Ljubljana, Slovenia         Institute "Jožef Stefan"         Hybrid polymer solar cells         2007-2009. (several visits, 4 weeks in total)         Munich, Germany         Walter Schottky Institute         Application of semiconductor nanostructures in third         generation photovoltaics         LANGUAGES         Croatian         English, 5
Degree         Institution         Place         Date         INFORMATION ON ADDITIONAL TO         Year         Place         Institution         Field of training         MOTHER TONGUE AND FOREIGN         Mother tongue         Foreign language and command of         foreign language on a scale from 2         (sufficient) to 5 (excellent)         Foreign language on a scale from 2         (sufficient) to 5 (excellent)	PhD         Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture         Split         04.12.2009.         RAINING         2013. (7 weeks)         Freiburg, Germany         Fraunhofer ISE         Photovoltaics         2011. (3 weeks)         Ljubljana, Slovenia         Institute "Jožef Stefan"         Hybrid polymer solar cells         2007-2009. (several visits, 4 weeks in total)         Munich, Germany         Walter Schottky Institute         Application of semiconductor nanostructures in third generation photovoltaics         LANGUAGES         Croatian         English, 5         Italian, 2
Degree         Institution         Place         Date         INFORMATION ON ADDITIONAL T         Year         Place         Institution         Field of training         MOTHER TONGUE AND FOREIGN         Mother tongue         Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)         Foreign language on a scale from 2 (sufficient) to 5 (excellent)	PhD         Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture         Split         04.12.2009. <b>RAINING</b> 2013. (7 weeks)         Freiburg, Germany         Fraunhofer ISE         Photovoltaics         2011. (3 weeks)         Ljubljana, Slovenia         Institute "Jožef Stefan"         Hybrid polymer solar cells         2007-2009. (several visits, 4 weeks in total)         Munich, Germany         Walter Schottky Institute         Application of semiconductor nanostructures in third         generation photovoltaics         LANGUAGES         Croatian         English, 5         Italian, 2

Earlier experience as course teacher of similar courses (name title of course, study programme where it is/was offered, and level of study programme)	Optoelectronics, Professional study of Electronics
Authorship of university/faculty textbooks in the field of the course	
Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)	<ol> <li>I. Marasović, Ž. Milanović, T. Betti, "Resistance Fluctuations in GaAs Nanowire Grids", Journal of Nanomaterials, (2014), 428390</li> <li>I. Marasović, T. Garma, T. Betti, "Modelling a nanowire grid for light-sensing applications", Journal of Physics D: Applied Physics 45 (2012)</li> </ol>
Professional and scholarly articles published in the last five years in subjects of teaching methodology and teaching quality (5 works at most)	
Professional, science and artistic projects in the field of the course carried out in the last five years (5 at most)	
The name of the programme and the volume in which the main teacher passed exams in/acquired the methodological-psychological- didactic-pedagogical group of competences?-pedagoške kompetencije?	
PRIZES AND AWARDS, STUDENT	EVALUATION
Prizes and awards for teaching and scholarly/artistic work	
Results of student evaluation taken in the last five years for the course that is comparable to the course described in the form (evaluation organizer, average grade, note on grading scale and course evaluated)	

First and last name and title of teacher	Zoran Blažević, Ph.D., Full Professor
The course he/she teaches in the	
proposed study programme	Radio Communications
GENERAL INFORMATION ON COL	IRSE TEACHER
Address	Tolstojeva 47. 21000 Split, HR
Telephone number	+385 21 305676
E-mail address	zblaz@fesb.hr
Personal web page	
Year of birth	1968
Scientist ID	238956
Research or art rank, and date of	Scientific Advisor 20/00/2010
last rank appointment	Scientific Adviser, 20/06/2016
Research-and-teaching, art-and-	
teaching or teaching rank, and	Senior Full Professor, 16/07/2016
date of last rank appointment	
Area and field of election into	Technical Sciences, Field Electrical Engineering
research or art rank	
INFORMATION ON CURRENT EMP	2LOYMENT
Institution where employed	Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture
Date of employment	14/02/2006
Name of position (professor,	
researcher, associate teacher,	Professor
etc.)	
Field of research	Radio-channel modelling, antennas, microwaves
	I Parl and the second
INFORMATION ON EDUCATION -	Highest degree earned
Degree	PND Enculty of Electrical Engineering, Machanical Engineering and
Institution	Naval Architecture
Place	Split
Date	30/05/2005
INFORMATION ON ADDITIONAL T	RAINING
Year	
Place	
Institution	
Field of training	
MOTHER TONGUE AND FOREIGN	LANGUAGES
Mother tongue	Croatian
Foreign language and command of	English (4)
(sufficient) to 5 (excellent)	
Foreign language and command of	
foreign language on a scale from 2	
(sufficient) to 5 (excellent)	
Foreign language and command of	
foreign language on a scale from 2	
(sufficient) to 5 (excellent)	
COMPETENCES FOR THE COURS	E
Earlier experience as course	
teacher of similar courses (name	
title of course, study programme	
where it is/was offered, and level	
of study programme)	
Authorship of university/faculty	
lexibooks in the field of the course	

Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)	<ol> <li>Šolić, Petar; Blažević, Zoran; Škiljo, Maja; Patrono, Luigi. Impact of Tag Responsiveness on Gen2 RFID Throughput. // IEEE communications letters. 20 (2016), 11; 2181-2184</li> <li>Šolić, Petar; Maras, Josip; Radić, Joško; Blažević, Zoran. Comparing Theoretical and Experimental Results in Gen2 RFID Throughput. // leee transactions on automation science and engineering. 14 (2016), 1; 349-357</li> <li>Škiljo, Maja; Blažević, Zoran.</li> <li>Spherical helices for resonant wireless power transfer. // International Journal of Antennas and Propagation. 2013 (2013); 426574-1-426574-12</li> <li>Škiljo, Maja; Blažević, Zoran; Poljak, Dragan.</li> <li>Interaction Between Human and Near Field of Wireless Power Transfer System. // Progress In Electromagnetics Research C. 67 (2016); 1-10</li> <li>Blažević, Zoran; Škiljo, Maja; Poljak, Dragan.</li> <li>Comparison of Generalized Telegrapher Equations Approach and Circuit Model for Wireless Power Transfer // Proceedings of Softcom 2016 Split, 2016. 1-5</li> </ol>
Professional and scholarly articles published in the last five years in subjects of teaching methodology and teaching quality (5 works at most)	
Professional, science and artistic projects in the field of the course carried out in the last five years (5 at most)	<ol> <li>Propagation factors in radio-networks planning, project MZOS 023-0361566-1613, 2007-2013</li> </ol>
The name of the programme and the volume in which the main teacher passed exams in/acquired the methodological-psychological- didactic-pedagogical group of competences?-pedagoške kompetencije?	
PRIZES AND AWARDS, STUDENT	EVALUATION
Prizes and awards for teaching and scholarly/artistic work	
Results of student evaluation taken in the last five years for the course that is comparable to the course described in the form (evaluation organizer, average grade, note on grading scale and course evaluated)	4,8/5

First and last name and title of teacher	Mirjana Bonković, Ph.D., Full Professor
The course he/she teaches in the proposed study programme	Elements of robotics Microcontrollers and embedded network systems Mechatronics Practicals Practicum in Digital Image Processing
GENERAL INFORMATION ON COUR	SE TEACHER
Address	R. Boškovića 32, 21 000 Split, HR
Telephone number	+385 91 4 305 641
E-mail address	mirjana.bonkovic@fesb.hr
Personal web page	
Year of birth	
Scientist ID	190481
Research or art rank, and date of last	
rank appointment	
Research-and-teaching, art-and-	
teaching or teaching rank, and date	Full professor, 2016.
of last rank appointment	
Area and field of election into	l echnical Sciences, Field Electrical engineering
INFORMATION ON CURRENT EMPLO	DYMENT
Institution where employed	Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture
Date of employment	01/7/1991
Name of position (professor,	Full professor, 2016.
researcher, associate teacher, etc.)	
Field of research	3D modelling, robotics, computer vision, optimization
Function	
INFORMATION ON EDUCATION – Hi	ghest degree earned
Degree	PhD
Institution	Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture
Place	Split
Date	10/3/2000.
INFORMATION ON ADDITIONAL TRA	INING
Year	1995
Place	Oxford, UK
Institution	Robotics Research Group
Field of training	Robot production lines optimization
MOTHER TONGUE AND FOREIGN L	ANGUAGES
Mother tongue	Croatian
Foreign language and command of	
foreign language on a scale from 2	English (5)
(sufficient) to 5 (excellent)	
Foreign language and command of	
foreign language on a scale from 2	German (2)
(sufficient) to 5 (excellent)	
Foreign language and command of	
foreign language on a scale from 2 (sufficient) to 5 (excellent)	
COMPETENCES FOR THE COURSE	
Earlier experience as course teacher	
of similar courses (name title of	Computers and Programming, Undergraduate study
course, study programme where it	program
is/was offered, and level of study	Programming, Undergraduate professional study program
programme)	

	Zbirka riješenih zadataka iz programiranja u Cu, upute za
Authorship of university/faculty	laboratorijske vježbe, Interna skripta, FESB Split
textbooks in the field of the course	Mikroregulatori i ugradbeni mrežni sustavi, Interna skripta,
_	FESB Split, 2014
Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)	<ol> <li>Kuzmanic Skelin, Ana; Grujić, Tamara; Bonković, Mirjana, Visual Peoplemeter: A Vision-based Television Audience Measurement System. // Advances in Electrical and Computer Engineering. 14 (2014), 4; 73- 80</li> <li>Mazić Igor, Bonković Mirjana, Džaja Barbara. Two-Level Coarse-to-Fine Classification Algorithm for Asthma Wheezing Recognition in Children's Respiratory Sounds. //Biomedical Signal Processing and Control. 5 (2015) ; 105-118 (članak, znanstveni).</li> <li>Džaja, Barbara; Bonković, Mirjana; Malešević, Ljubomir. Solving a two-colour problem by applying probabilistic approach to a full-colour multi- frame image super- resolution. // Signal processing. Image communication. 28 (2013), 5; 509-521 (članak, znanstveni).</li> <li>Čić, Maja; Šoda, Joško; Bonković, Mirjana. Automatic classification of infant sleep based on instantaneous frequencies in a single-channel EEG signal. // Computers in biology and medicine. 43 (2013) , 12; 2110-2117 (članak, znanstveni).</li> <li>Musić, Josip; Bonković, Mirjana; Cecić, Mojmil. Comparison of uncalibrated model-free visual servoing methods for small amplitude movement: a simulation study. //International journal of advanced robotic systems 11 (2014) 108: 1-16 (članak znanstveni)</li> </ol>
Professional and scholarly articles	
published in the last five years in subjects of teaching methodology and teaching quality (5 works at most)	
	Provjera inovativnog koncepta, Alarm astmatičnog napada,
	projekt HAMAG-BICRO, agencija za malo gospodarstvo, inovacije i investicije., 2014. /2015.
Professional, science and artistic projects in the field of the course carried out in the last five years (5 at most)	"Virtual CulTourist - Razvoj korisničkog sučelja za virtualno predstavljanje kulturne baštine kroz integraciju inovativnih 3D tehnologija", 2016-2017. Programa tehnološkog razvoja, istraživanja i primjene inovacija (20142017.), SDŽ "Napredne metode 3D virtualizacije – na putu prema virtualnom turizmu i digitalizaciji splitske kulturne baštine", 2015-2016. Programa tehnološkog razvoja, istraživanja i primjene inovacija (20142017.), SDŽ
The name of the programme and the volume in which the main teacher	
passed exams in/acquired the	
methodological-psychological-	
competences?-pedagoške	
PRIZES AND AWARDS, STUDENT E Prizes and awards for teaching and	ZALUATION
scholarly/artistic work	

Results of student evaluation taken	
in the last five years for the course	
that is comparable to the course	
described in the form (evaluation	
organizer, average grade, note on	
grading scale and course evaluated)	

First and last name and title of teacher	Spomenka Bovan, M.Sc., Senior Lectuter
The course he/she teaches in the	Electronic Circuits
proposed study programme	Electronic Devices
Address	Split Trandhaimaka 4d
Tolophono number	Spiit, Hohuneiniska 40
	+303 21 303 097
Personal web page	Spotterika.bovart@resp.tit
Year of birth	1960
Scientist ID	154920
Research or art rank and date of	101020
last rank appointment	
Research-and-teaching, art-and-	Consistent and the strength
teaching or teaching rank, and	
date of last rank appointment	17.04.2013.
Area and field of election into	Technical sciences, electrical engineering
research or art rank	
INFORMATION ON CURRENT EMP	
Institution where employed	Faculty of Electrical Engineering, Mechanical Engineering and
Date of employment	22.04.1987.
researcher, associate teacher	Senior lecturer
etc)	
Field of research	Electronics
Function	
	Highest degree earned
Degree	M Sc
Institution	Faculty of Electrical Engineering
Place	Zagreb
Date	27.02.1992.
	PAINING
Vear	AINING
Place	
Institution	
Field of training	
MOTHER TONGUE AND FOREIGN	LANGUAGES
Foreign language and command of	Cioalian
foreign language on a scale from 2	English (5)
(sufficient) to 5 (excellent)	
Foreign language and command of	
foreign language on a scale from 2	Italian (3)
(sufficient) to 5 (excellent)	
Foreign language and command of	
foreign language on a scale from 2	German (2)
(sufficient) to 5 (excellent)	
COMPETENCES FOR THE COURS	SE
	Electronic devices, Professional study programme, 2nd
Earlier experience as course	semester
teacher of similar courses (name	Electronic circuits, Professional study programme, 3rd
title of course, study programme	semester
where it is/was offered, and level	Basic electronics, Professional study Programme, 2nd
or study programme)	semester

Authorship of university/faculty textbooks in the field of the course	<ol> <li>S. Bovan: Elektronički elementi – Repetitorij s laboratorijskim vježbama, Veleučilište u Splitu, 2000.</li> <li>S. Bovan, I. Marasović: Poluvodički elektronički elementi – upute za laboratorijske vježbe, autorizirana skripta, FESB, Split</li> <li>S. Bovan: Elektronički sklopovi – Upute za laboratorijske vježbe,autorizirana skripta, FESB, Split</li> <li>S. Bovan: Osnove elektronike – autorizirana predavanja, e- learning portal FESB</li> </ol>
Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)	
Professional and scholarly articles published in the last five years in subjects of teaching methodology and teaching quality (5 works at most)	
Professional, science and artistic projects in the field of the course carried out in the last five years (5 at most)	
The name of the programme and the volume in which the main teacher passed exams in/acquired the methodological-psychological- didactic-pedagogical group of competences?-pedagoške kompetencije?	
PRIZES AND AWARDS, STUDENT	EVALUATION
Prizes and awards for teaching and scholarly/artistic work	
Results of student evaluation taken in the last five years for the course that is comparable to the course described in the form (evaluation organizer, average grade, note on grading scale and course evaluated)	4,6

First and last name and title of	Mira Braović Plavša senior lecturer
teacher	
The course he/she teaches in the proposed study programme	English Language1, English Language 2
GENERAL INFORMATION ON COL	IRSE TEACHER
Address	Nazorov prilaz 22, 21000 Split
Telephone number	00385915052155
E-mail address	playsabm@fesb.hr
Personal web page	
Year of birth	1975
Scientist ID	
Research or art rank, and date of	
last rank appointment	
Research-and-teaching, art-and-	
teaching or teaching rank, and	Senior lecturer 19.2.2014.
date of last rank appointment	
Area and field of election into	Humanities Philology
research or art rank	Tranalities, Thiology
INFORMATION ON CURRENT EMP	PLOYMENT
Institution where employed	V. Grammmar School Vladimir Nazor
Date of employment	
Name of position (professor,	
researcher, associate teacher,	teacher
etc.)	
Field of research	English as foreign language and Italian as foreign language
Function	
INFORMATION ON EDUCATION –	Highest degree earned
Degree	English and Italian Teacher
Institution	Faculty of Philosophy Zadar
Place	Zadar
Date	19.11.1998.
INFORMATION ON ADDITIONAL T	RAINING
Year	
Place	
Institution	
Field of training	
MOTHER TONGUE AND FOREIGN	LANGUAGES
Mother tongue	Croatian
Foreign language and command of	
foreign language on a scale from 2	English language 5
(sufficient) to 5 (excellent)	
Foreign language and command of	
foreign language on a scale from 2	Italian language 5
(sufficient) to 5 (excellent)	
Foreign language and command of	
toreign language on a scale from 2	
(sufficient) to 5 (excellent)	
COMPETENCES FOR THE COURS	
Earlier experience as course	
teacher of similar courses (name	English language for special purposes (Facultyof Philosophy
title of course, study programme	Split)
of study programme)	English for special purposes (Art Academy Split)
Authorship of university/foculty	
textbooks in the field of the course	

Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)	(2012.) Mira Braović Plavša and Ivana BojčićLanguage Borrowings The periodical of Međimursko Veleučilište, Čakovec (2016) Mira BraovićPlavša and Ivana Bojčić What kind of Culture do we teach? The periodical Folia Linguistica et Litteraria (2016) Nikšić, Montenegro, 12
Professional and scholarly articles published in the last five years in subjects of teaching methodology and teaching quality (5 works at most)	(2014) Mira Braović Plavša/ Ivana Bojčić: The need analysis in general English language courses, Školski vjesnik, 63, Split
Professional, science and artistic projects in the field of the course carried out in the last five years (5 at most)	
The name of the programme and the volume in which the main teacher passed exams in/acquired the methodological-psychological- didactic-pedagogical group of competences?-pedagoške kompetencije?	University degree at the Faculty of Philology – pedagogical group
PRIZES AND AWARDS, STUDENT EVALUATION	
Prizes and awards for teaching and scholarly/artistic work	
Results of student evaluation taken in the last five years for the course that is comparable to the course described in the form (evaluation organizer, average grade, note on grading scale and course evaluated)	4.9/5
First and last name and title of teacher	Mojmil Cecić, Ph.D., Full Professor
--	--
The course he/she teaches in the proposed study programme	Electronic CAD, Control System Design, Modelling and Simulation
GENERAL INFORMATION ON COURS	E TEACHER
Address	Slavonska 6. Split
Telephone number	091 4 305 828
E-mail address	mcecic@fesb.hr
Personal web page	-
Year of birth	1960.
Scientist ID	122922
Research or art rank, and date of last	Scientific Advisor 20th November 2007
rank appointment	
Research-and-teaching, art-and-	
teaching or teaching rank, and date of	Full professor; 20 <sup>th</sup> March, 2014.
last rank appointment	
Area and field of election into research or art rank	Technical Science, Electrotehnics
INFORMATION ON CURRENT EMPLO	YMENT
Institution where employed	Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture
Date of employment	15 <sup>th</sup> January, 1985.
Name of position (professor,	Professor
researcher, associate teacher, etc.)	
Field of research	Control Systems, Robotics
Function	Head of the Department of Electronics and Computer
INFORMATION ON EDUCATION – High	nest degree earned
Degree	PhD.
Institution	Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture
Place	Split
Date	25 <sup>th</sup> June, 1999.
INFORMATION ON ADDITIONAL TRAIL	NING
Year	1988.
Place	Budapest, Hungary
Institution	Budepest University of Technology and Economics
Field of training	Industrial robotics
MOTHER TONGUE AND FOREIGN LAI	NGUAGES
Mother tongue	Croatian
Foreign language and command of	
foreign language on a scale from 2	English (4)
(sufficient) to 5 (excellent)	
COMPETENCES FOR THE COURSE	
Earlier experience as course teacher	1. Automatics I (Vocational Study Programme)
of similar courses (name title of	2. Automatics II (Vocational Study Programme)
course, study programme where it	3. Automatic Control I (Undergraduate Study Programme)
is/was offered, and level of study	4. Automatic Control II (Undergraduate Study
programme)	5. System Theory (Undergraduate Study Programme)
	6 Nonlinear Control Systems (Graduate Study
	Programme)
Authorship of university/faculty	1. V. Zanchi, M. Bonković, M. Cecić, Programska podrška
textbooks in the field of the course	linearnoj teoriji automatskog upravljanja, FESB, Split.
Professional, scholarly and artistic	1. Stančić, Ivo; Cecić, Mojmil; Ljubičić, Ante; Identification
articles published in the last five years	of UAV Engine Parameters. // WSEAS TRANSACTIONS

in the field of the course (5 works at	ON SYSTEMS AND CONTROL. 10 (2015) ; 179-185
most)	(članak, znanstveni).
	Comparison of uncalibrated model-free visual servoing
	methods for small amplitude movement: a simulation study.
	// International journal of advanced robotic systems. 11
	(2014) , 108; 1-16 (članak, znanstveni)
	3. Cecic, Mojmil; Papic, Vladan; Bonkovic, Mirjana; Grujic, Tamara: Musić, Josin: Kuzmanić Skelin, Ana: Stančić, Ivo:
	Marasović, Tea; Čić, Maja; Pleština, Vladimir; Science and
	Technology in Biomedical Engineering: LaBACS Case
	Example. // Physical Medicine and Rehabilitation -
	International. 1 (2014), 2; 1-11 (clanak, znanstveni).
	Cost Adaptive Scanner Concept for Mobile Robots. //
	Ingeniería e Investigación. 34 (2014), 3; 37-43 (članak,
	znanstveni).
	5. Cecic, Mojmil; Krajci, Vesna; Bonkovic, Mirjana;
	Controller Parameters for Direct-Current Motor. // Journal
	of Computations and Modelling. 2 (2012.), 3; 67-88
	(članak, znanstveni).
Professional and scholarly articles	1. Stančić, Ivo; Cecić, Mojmil; Ljubičić, Ante; Identification
subjects of teaching methodology and	ON SYSTEMS AND CONT ROL. 10 (2015) : 179-185
teaching quality (5 works at most)	(članak, znanstveni).
	2. Musić, Josip; Bonković, Mirjana; Cecić, Mojmil;
	Comparison of uncalibrated model-free visual servoing
	// International journal of advanced robotic systems. 11
	(2014) , 108; 1-16 (članak, znanstveni)
	3. Cecić, Mojmil; Papić, Vladan; Bonković, Mirjana; Grujić,
	Lamara; Musić, Josip; Kuzmanić Skelin, Ana; Stančić, Ivo; Marasović, Tea: Čić, Maia: Pleština, Vladimir: Science and
	Technology in Biomedical Engineering: LaBACS Case
	Example. // Physical Medicine and Rehabilitation -
	International. 1 (2014), 2; 1-11 (članak, znanstveni).
	4. Stancic, Ivo; Music, Josip; Cecic, Mojmil; A Novel Low-
	Ingeniería e Investigación. 34 (2014), 3; 37-43 (članak,
	znanstveni).
	5. Cecić, Mojmil; Krajči, Vesna; Bonković, Mirjana;
	Optimization of Model-Reference Variable-Structure
	of Computations and Modelling. 2 (2012.), 3; 67-88
	(članak, znanstveni).
Professional, science and artistic	1. Projekt 0023022: Biomechanics of Human Walking,
projects in the field of the course	Control and Rehabilitation, MZT RH, 20082013.
most)	Luman Activities (RIPrePAkt), project FESB
The name of the programme and the	
volume in which the main teacher	
passed exams in/acquired the	
methodological-psychological-didactic-	
pedagoške kompetencije?	
PRIZES AND AWARDS, STUDENT EV	ALUATION
Prizes and awards for teaching and	
scholarly/artistic work	

Results of student evaluation taken in the is comparable to the course described in average grade, note on grading scale at	ne last five years for the course that in the form (evaluation organizer, ad course evaluated)
First and last name and title of	Zlatko Ćesić Ph.D. Assistant Professor
teacher The course he/she teaches in the proposed study programme	Commercial Law
GENERAL INFORMATION ON COLU	RSE TEACHER
Address	A B Šimića 12 21000 Split HB
Telephone number	+385 21 375286
E-mail address	cesiczlatko@gmail.com
Personal web page	
Year of birth	1964.
Scientist ID	285670
Research or art rank, and date of	Scientific Advisor 2014
last rank appointment	
Research-and-teaching, art-and- teaching or teaching rank, and date of last rank appointment	Assistent Professor, 2015.
Area and field of election into	Social Sciences, Field Law
Institution where employed	Libertas International University
Date of employment	
Name of position (professor	2010.
researcher, associate teacher, etc.)	Professor
Field of research	Commercial and Company Law
Function	
INFORMATION ON EDUCATION - H	lighest degree earned
Degree	PhD
Institution	Faculty of Law
Place	Split
Date	1995.
INFORMATION ON ADDITIONAL TR	RAINING
Year	
Place	
Institution	
Mother tongue	
Foreign language and command of	
foreign language on a scale from 2 (sufficient) to 5 (excellent)	English (3-4)
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	Italian (2-3)
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	
COMPETENCES FOR THE COURS	
Earlier experience as course	Commercial Law, Undergraduate study programme, Graduate
teacher of similar courses (name	study programme
title of course, study programme	Company Law, Undergraduate study programme, Graduate
where it is/was offered, and level of	study programme
study programme)	Corporative Law, Graduate study programme
Authorship of university/faculty	2009
textbooks in the field of the course	Komentar Zakona o obveznim odnosima, RRiF, Zagreb, 2005.

	Komentar Zakona o trgovačkim društvima, RRiF, Zagreb, 2008.
Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)	Otkaz i raskid ugovora, RRiF, 2016. Regulative Solvency II kao preduvjet poslovanja osiguratelja u Europskoj Uniji, Mostariensia, 2015. Isključenje člana iz društva s ograničenom odgovornošću, Zbornik radova Ekonomskog fakulteta u Mostaru, 2012.
Professional and scholarly articles published in the last five years in subjects of teaching methodology and teaching quality (5 works at most)	Priručnik upravljanja kvalitetom, Veleučilište u Kninu, 2013.
Professional, science and artistic projects in the field of the course carried out in the last five years (5 at most)	
The name of the programme and the volume in which the main teacher passed exams in/acquired the methodological-psychological- didactic-pedagogical group of competences?-pedagoške kompetencije?	
PRIZES AND AWARDS, STUDENT	EVALUATION
Prizes and awards for teaching and scholarly/artistic work	
Results of student evaluation taken in the last five years for the course that is comparable to the course described in the form (evaluation organizer, average grade, note on grading scale and course evaluated)	4,8/5

First and last name and title of teacher	Marin Despalatović, Ph.D., Associate Professor
The course he/she teaches in the	Electrical Drives
proposed study programme	Design of Low Voltage Facilities
GENERAL INFORMATION ON COL	JRSE TEACHER
Address	R. Boškovića 32, HR-21000 Split
Telephone number	+385 (0)21 305 813
E-mail address	marin.despalatovic@fesb.hr
Personal web page	
Year of birth	1976.
Scientist ID	248733
Research or art rank, and date of	Senior scientific associate, November 22 <sup>nd</sup> , 2012.
Research and teaching art and	
teaching or teaching rank and	Associate professor September 20th 2016
date of last rank appointment	
Area and field of election into	
research or art rank	i echnical Sciences – Field Electrical Engineering
INFORMATION ON CURRENT EMP	PLOYMENT
Institution where employed	University of Split, Faculty of Electrical Engineering,
Institution where employed	Mechanical Engineering and Naval Architecture
Date of employment	May 10 <sup>th</sup> , 2001.
Name of position (professor,	_
researcher, associate teacher,	Associate professor
etc.)	Descende and teaching in all string markings and drives
Field of research	Research and teaching in electrical machines and drives
INFORMATION ON EDUCATION –	Highest degree earned
Degree	PhD (In Electrical Engineering)
Institution	Mechanical Engineering and Naval Architecture
Place	Snlit
Date	April 24 <sup>th</sup> . 2009.
INFORMATION ON ADDITIONAL T	RAINING
Year	
Place	
Institution	
Field of training	
MOTHER TONGUE AND FOREIGN	LANGUAGES
Mother tongue	Croatian
Foreign language and command of	
foreign language on a scale from 2	English (4)
(sufficient) to 5 (excellent)	
Foreign language and command of	
foreign language on a scale from 2	
(sufficient) to 5 (excellent)	
Foreign language and command of	
(sufficient) to 5 (excellent)	
COMPETENCES FOR THE COURS	
	Electrical Machines – 113 – Undergraduate Study: Electrical
Earlier experience as course	Engineering and Information Technology
teacher of similar courses (name	Modeling of Electromechanical Systems – 231 – Graduate
title of course, study programme	Study: Electrical Engineering
of study programme)	Transients in Electrical Machines - 231, 232 - Graduate
or study programme)	Study: Electrical Engineering

	Electrical Drives – 261, 262, 263 – Graduate Study: Mechanical Engineering
Authorship of university/faculty	
textbooks in the field of the course	
Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)	<ol> <li>Majić, G.; Despalatović, M.; Terzić, B.; Slutej, A.: Influence of Dead-time on Design of LCL-filter for Three-phase Voltage Source Converter, EDPE Conference Proceedings, 2013.</li> <li>Despalatović, M.; Jadrić, M.; Terzić, B.: Modeling of Saturated Synchronous Generator Based on Steady-State Operating Data, IEEE Transactions on Industry Applications, 48(1), 2012.</li> <li>Terzić, B.; Despalatović, M.; Slutej, A.: Magnetization Curve Identification of Vector-Controlled Induction Motor at Low- Load Conditions, Automatika, 53, 2012.</li> <li>Jadrić, M.; Terzić, B.; Despalatović, M.; Majić, G.; Slutej, A.; Šimić, T.: Identification of Rotor Resistance and Transient Inductance of Induction Motors Using Frequency Selection Criterion, Proc. of the XXth International Conference on Electrical Machines, 2012.</li> <li>Jadrić, M.; Despalatović, M.; Terzić, B.: Development of synchronous generator saturation model from steady-state operating data, Electric Power Systems Research, 80(11), 2010.</li> </ol>
Professional and scholarly articles published in the last five years in subjects of teaching methodology and teaching quality (5 works at most)	
Professional, science and artistic projects in the field of the course carried out in the last five years (5 at most)	<ol> <li>Smart Grid Metrology Infrastructure, HRZZ</li> <li>A safer and more efficient cogeneration / trigeneration facilities, co-financing EU fund for science and innovation</li> <li>Development of electrical drives for large industrial cranes working in heavy duty conditions, collaboration with ABB Crane Systems</li> <li>On-line parameter identification of synchronous generator, MZOŠ</li> <li>State and parameter estimation of electrical machines, MZT</li> </ol>
The name of the programme and the volume in which the main teacher passed exams in/acquired the methodological-psychological- didactic-pedagogical group of competences.	
PRIZES AND AWARDS, STUDENT	EVALUATION
Prizes and awards for teaching and scholarly/artistic work	
Results of student evaluation taken in the last five years for the course that is comparable to the course described in the form	Evaluation organizer University of Split Scale from 2 (sufficient) to 5 (excellent) Course: Electrical Drives – 511, average grade 4.0 Electrical Machines – 113, average grade 4.2
grade, note on grading scale and course evaluated)	Modeling of Electromechanical Systems – 231, average grade 4.5

The course he/she teaches in the proposed study programmeElectromagnetic Compatit Human Exposure to Electi Computer Aided AnalysisGENERAL INFORMATION ON COURSE TEACHERAddressMatoševa 1, SplitTelephone number021305694E-mail addressvdoric@fesb.hrPersonal web pagehttps://nastava.fesb.hr/nasYear of birth1974.Scientist ID248744Research or art rank, and date of last rank appointmenthigher scientific collaboratResearch-and-teaching, art-and- teaching or teaching rank, and date of last rank appointmentAssociate Professor, SeptInstitution where employedFaculty of Electrical Engin Naval ArchitectureDate of employment20.01.2001.Name of position (professor, researcher, associate teacher, etc.)Faculty of Electrical Engin Naval ArchitectureField of researchTechnical sciences FunctionField of researchTechnical sciences Function	ility, omagnetic Radiation, of Radiating Structures tava/nastavnici/detalji/vdoric or, February 2013. omber 2016. cal Engineering, Radio
Human Exposure to Electric Computer Aided AnalysisGENERAL INFORMATION ON COURSE TEACHERAddressMatoševa 1, SplitTelephone number021305694E-mail addressvdoric@fesb.hrPersonal web pagehttps://nastava.fesb.hr/nasYear of birth1974.Scientist ID248744Research or art rank, and date of last rank appointmenthigher scientific collaboratResearch-and-teaching, art-and- teaching or teaching rank, and date of last rank appointmentAssociate Professor, SeptINFORMATION ON CURRENT EMPLOYMENTInstitution where employedFaculty of Electrical Engin Naval ArchitectureDate of employment20.01.2001.Name of position (professor, researcher, associate teacher, etc.)Associate ProfessorField of researchTechnical sciences FunctionFaculty of Electrical Engin Naval ArchitectureDate of employment20.01.2001.Name of position (professor, researcher, associate teacher, etc.)Associate ProfessorField of researchTechnical sciencesFunctionERASMUS coordinator	omagnetic Radiation, of Radiating Structures tava/nastavnici/detalji/vdoric or, February 2013. ember 2016. cal Engineering, Radio
Computer Aided AnalysisGENERAL INFORMATION ON COURSE TEACHERAddressMatoševa 1, SplitTelephone number021305694E-mail addressvdoric@fesb.hrPersonal web pagehttps://nastava.fesb.hr/nasYear of birth1974.Scientist ID248744Research or art rank, and date of last rank appointmenthigher scientific collaboratResearch-and-teaching, art-and- teaching or teaching rank, and date of last rank appointmentAssociate Professor, SeptArea and field of election into research or art rankTechnical sciences, Electr communicationsINFORMATION ON CURRENT EMPLOYMENTFaculty of Electrical Engin Naval ArchitectureDate of employment20.01.2001.Name of position (professor, researcher, associate teacher, etc.)Faculty of Electrical Engin Naval ArchitectureField of researchTechnical sciences FunctionField of researchTechnical sciences Function	tava/nastavnici/detalji/vdoric 
GENERAL INFORMATION ON COURSE TEACHERAddressMatoševa 1, SplitTelephone number021305694E-mail addressvdoric@fesb.hrPersonal web pagehttps://nastava.fesb.hr/nasYear of birth1974.Scientist ID248744Research or art rank, and date of last rank appointmenthigher scientific collaboratResearch-and-teaching, art-and- teaching or teaching rank, and date of last rank appointmentAssociate Professor, SeptArea and field of election into 	tava/nastavnici/detalji/vdoric or, February 2013. ember 2016. cal Engineering, Radio
AddressMatoševa 1, SplitTelephone number021305694E-mail addressvdoric@fesb.hrPersonal web pagehttps://nastava.fesb.hr/nastava.fesb.h	tava/nastavnici/detalji/vdoric or, February 2013. ember 2016. cal Engineering, Radio
Telephone number021305694E-mail addressvdoric@fesb.hrPersonal web pagehttps://nastava.fesb.hr/nasYear of birth1974.Scientist ID248744Research or art rank, and date of last rank appointmenthigher scientific collaboratResearch-and-teaching, art-and- teaching or teaching rank, and date of last rank appointmentAssociate Professor, SeptArea and field of election into research or art rankTechnical sciences, Electr communicationsINFORMATION ON CURRENT EMPLOYMENTFaculty of Electrical Engin Naval ArchitectureDate of employment20.01.2001.Name of position (professor, researcher, associate teacher, etc.)Associate ProfessorField of researchTechnical sciencesFunctionERASMUS coordinator	tava/nastavnici/detalji/vdoric or, February 2013. ember 2016. cal Engineering, Radio
E-mail addressVdoric@resb.nrPersonal web pagehttps://nastava.fesb.hr/nasta	tava/nastavnici/detalji/vdoric or, February 2013. ember 2016. cal Engineering, Radio ering, Mechanical Engineering and
Personal web pageIntips.//nastava.tesb.fi/mastYear of birth1974.Scientist ID248744Research or art rank, and date of last rank appointmenthigher scientific collaboratResearch-and-teaching, art-and- teaching or teaching rank, and date of last rank appointmentAssociate Professor, SeptArea and field of election into research or art rankTechnical sciences, Electric communicationsINFORMATION ON CURRENT EMPLOYMENTFaculty of Electrical Engin Naval ArchitectureDate of employment20.01.2001.Name of position (professor, researcher, associate teacher, etc.)Associate ProfessorField of researchTechnical sciencesFunctionERASMUS coordinator	or, February 2013. Ember 2016. cal Engineering, Radio
Teal of bittin1374.Scientist ID248744Research or art rank, and date of last rank appointmenthigher scientific collaboratResearch-and-teaching, art-and- teaching or teaching rank, and date of last rank appointmentAssociate Professor, SeptArea and field of election into research or art rankTechnical sciences, Electr communicationsINFORMATION ON CURRENT EMPLOYMENTFaculty of Electrical Engin Naval ArchitectureDate of employment20.01.2001.Name of position (professor, 	or, February 2013. ember 2016. cal Engineering, Radio ering, Mechanical Engineering and
Colorities (D)End (D)Research or art rank, and date of last rank appointmenthigher scientific collaboratResearch-and-teaching, art-and- teaching or teaching rank, and date of last rank appointmentAssociate Professor, SeptArea and field of election into research or art rankTechnical sciences, Electr communicationsINFORMATION ON CURRENT EMPLOYMENTInstitution where employedFaculty of Electrical Engin Naval ArchitectureDate of employment20.01.2001.Name of position (professor, researcher, associate teacher, etc.)Associate ProfessorField of researchTechnical sciencesFunctionERASMUS coordinator	or, February 2013. Ember 2016. cal Engineering, Radio
last rank appointmenthigher scientific collaboratResearch-and-teaching, art-and- teaching or teaching rank, and date of last rank appointmentAssociate Professor, SeptArea and field of election into research or art rankTechnical sciences, Electr communicationsINFORMATION ON CURRENT EMPLOYMENTInstitution where employedFaculty of Electrical Engin Naval ArchitectureDate of employment20.01.2001.Name of position (professor, researcher, associate teacher, 	ember 2016. cal Engineering, Radio eering, Mechanical Engineering and
Research-and-teaching, art-and- teaching or teaching rank, and date of last rank appointmentAssociate Professor, SeptArea and field of election into research or art rankTechnical sciences, Electr communicationsINFORMATION ON CURRENT EMPLOYMENTInstitution where employedFaculty of Electrical Engin Naval ArchitectureDate of employment20.01.2001.Name of position (professor, researcher, associate teacher, 	ember 2016. cal Engineering, Radio ering, Mechanical Engineering and
teaching or teaching rank, and date of last rank appointmentAssociate Professor, SeptArea and field of election into research or art rankTechnical sciences, Electr communicationsINFORMATION ON CURRENT EMPLOYMENTInstitution where employedFaculty of Electrical Engin Naval ArchitectureDate of employment20.01.2001.Name of position (professor, researcher, associate teacher, etc.)Associate ProfessorField of researchTechnical sciencesFunctionERASMUS coordinator	ember 2016. cal Engineering, Radio ering, Mechanical Engineering and
date of last rank appointmentArea and field of election into research or art rankTechnical sciences, Electr communicationsINFORMATION ON CURRENT EMPLOYMENTInstitution where employedFaculty of Electrical Engin Naval ArchitectureDate of employment20.01.2001.Name of position (professor, researcher, associate teacher, etc.)Associate ProfessorField of researchTechnical sciencesFunctionERASMUS coordinator	cal Engineering, Radio ering, Mechanical Engineering and
Area and field of election into research or art rankTechnical sciences, Electric communicationsINFORMATION ON CURRENT EMPLOYMENTInstitution where employedFaculty of Electrical Engin Naval ArchitectureDate of employment20.01.2001.Name of position (professor, 	eal Engineering, Radio ering, Mechanical Engineering and
Institution where employed       Faculty of Electrical Engin Naval Architecture         Date of employment       20.01.2001.         Name of position (professor, researcher, associate teacher, etc.)       Associate Professor         Field of research       Technical sciences         Function       ERASMUS coordinator	ering, Mechanical Engineering and
INFORMATION ON CURRENT EMPLOYMENT         Institution where employed       Faculty of Electrical Engin Naval Architecture         Date of employment       20.01.2001.         Name of position (professor, researcher, associate teacher, etc.)       Associate Professor         Field of research       Technical sciences         Function       ERASMUS coordinator	ering, Mechanical Engineering and
Institution where employedFaculty of Electrical Engin Naval ArchitectureDate of employment20.01.2001.Name of position (professor, researcher, associate teacher, etc.)Associate ProfessorField of researchTechnical sciencesFunctionERASMUS coordinator	eering, Mechanical Engineering and
Date of employment20.01.2001.Name of position (professor, researcher, associate teacher, etc.)Associate ProfessorField of researchTechnical sciencesFunctionERASMUS coordinator	
Name of position (professor, researcher, associate teacher, etc.)       Associate Professor         Field of research       Technical sciences         Function       ERASMUS coordinator	
researcher, associate teacher, etc.)     Associate Professor       Field of research     Technical sciences       Function     ERASMUS coordinator	
Field of research     Technical sciences       Function     ERASMUS coordinator	
Function ERASMUS coordinator	
Degree Phd	
Faculty of Electrical Engin	ering, Mechanical Engineering and
Institution Naval Architecture	5, 5 5
Place Split	
Date 02.02.2009.	
INFORMATION ON ADDITIONAL TRAINING	
Year	
Place	
Institution	
Field of training	
MOTHER TONGUE AND FOREIGN LANGUAGES	
Mother tongue Croatian	
Foreign language and command	
from 2 (sufficient) to 5 (excellent)	
Foreign language and command	
of foreign language on a scale	
of foreign language on a scale from 2 (sufficient) to 5 (excellent)	
of foreign language on a scale from 2 (sufficient) to 5 (excellent) Foreign language and command	
of foreign language on a scale from 2 (sufficient) to 5 (excellent) Foreign language and command of foreign language on a scale	
of foreign language on a scale from 2 (sufficient) to 5 (excellent) Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	
of foreign language on a scale from 2 (sufficient) to 5 (excellent) Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent) COMPETENCES FOR THE COURSE	
of foreign language on a scale         from 2 (sufficient) to 5 (excellent)         Foreign language and command         of foreign language on a scale         from 2 (sufficient) to 5 (excellent)         COMPETENCES FOR THE COURSE         Earlier experience as course	
of foreign language on a scale         from 2 (sufficient) to 5 (excellent)         Foreign language and command         of foreign language on a scale         from 2 (sufficient) to 5 (excellent)         COMPETENCES FOR THE COURSE         Earlier experience as course         teacher of similar courses (name	
of foreign language on a scale from 2 (sufficient) to 5 (excellent) Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent) COMPETENCES FOR THE COURSE Earlier experience as course teacher of similar courses (name title of course, study programme where it is/was offered, and level	
Field of training         MOTHER TONGUE AND FOREIGN LANGUAGES         Mother tongue       Croatian         Foreign language and command       English +4         from 2 (sufficient) to 5 (excellent)       English +4         Foreign language and command       English +4	

Authorship of university/faculty textbooks in the field of the course	<ol> <li>Poljak, D., Dorić, V., Antonijević S.: Modeliranje žičanih antena primjenom računala, Kigen, Zagreb, 2009.</li> <li>D.Poljak N.Kovač, V. Dorić, Numeričke metode u elektrotehnici – interna skripta, FESB-Split 2006.</li> </ol>
Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)	<ol> <li>D.Čavka, D. Poljak, V. Dorić, R. Goić, Transient analysis of grounding systems for wind turbines, Renewable energy, 43, 2012</li> <li>D. Poljak, R. Lucić, V. Dorić, S. Antonijević, Frequency domain boundary element versus time domain finite element model for the transient analysis of horizontal grounding electrode, Engineering analysis with boundary elements, 35, 3, 2011</li> <li>D. Poljak, V. Dorić, D. Čavka, On the use of isoparametric elements for BEM modeling of arbitrarily shaped thin wires in electromagnetic compatibility applications, Boundary Elements and other Mesh Reduction Methods XXXIV, 2012.</li> <li>D. Čavka, D. Poljak, V. Dorić, S. Antonijević, Some Computational Aspects of Using Current and Voltage Sources in Electromagnetic Models of Lightning Return Strokes, ICLP 2012, CONFERENCE PROCEEDINGS, 2012.</li> <li>V. Dorić, D. Poljak, K. El Kamichi Drissi, Human Exposure to Outdoor PLC System, PIERS 2011 Marrakesh Progress In Electromagnetics Research Symposium, 2011.</li> </ol>
Professional and scholarly articles published in the last five years in subjects of teaching methodology and teaching quality (5 works at most)	
Professional, science and artistic projects in the field of the course carried out in the last five years (5 at most)	EUROfusion – Code Development for Integrated Modelling 2014 Electromagnetic Interference (EMI) Study of Power Line Communications (PLC) Services 20112012.
The name of the programme and the volume in which the main teacher passed exams in/acquired the methodological- psychological-didactic- pedagogical group of competences?-pedagoške kompetencije?	
PRIZES AND AWARDS, STUDEN	F EVALUATION
Prizes and awards for teaching and scholarly/artistic work	
Results of student evaluation taken in the last five years for the course that is comparable to the course described in the form (evaluation organizer, average grade, note on grading scale and course evaluated)	

First and last name and title of teacher	Damir Jakus, Ph.D. Assistant Professor	
The course he/she teaches in the	Electrical distribution networks	
proposed study programme	Renewable energy sources	
GENERAL INFORMATION ON COL	IRSE TEACHER	
Address	Ruđera Boškovića 32, Split	
Telephone number	021 305 807	
E-mail address	damir.jakus@fesb.hr	
Personal web page	-	
Year of birth	1984.	
Scientist ID	292324	
Research or art rank, and date of	Research associate – 06/06/2013	
Research and teaching art and		
teaching or teaching rank and	Assistant professor - 17/07/2013	
date of last rank appointment		
Area and field of election into	Taskaisel Osianaaa, Field Electrical en sin aasian	
research or art rank	rechnical Sciences, Field Electrical engineering	
INFORMATION ON CURRENT EMP	PLOYMENT	
Institution where employed	Faculty of Electrical Engineering, Mechanical Engineering and	
	Naval Architecture	
Date of employment	15.01.2007.	
Name of position (professor,	Assistant professor	
etc.)	Assistant professor	
	electric power systems, renewable energy, power system	
Field of research	economics, power system optimization	
Function	Assistant professor	
INFORMATION ON EDUCATION -	Highest degree earned	
Degree	PhD	
Institution	Faculty of Electrical Engineering, Mechanical Engineering and	
	Naval Architecture	
Place	Split	
Date	09.11.2012.	
MOTHER TONGUE AND FOREIGN	LANGUAGES	
Mother tongue	Croatian	
Foreign language and command of		
foreign language on a scale from 2	Englisn(5)	
	-	
	Electrical networks - Undergraduate study program in	
Earlier experience as course	Electrical Engineering	
title of course study programme	Electrical distribution networks – Undergraduate study	
where it is/was offered, and level	program in Electrical Engineering	
of study programme)	Electrical distribution networks - University Department of	
	Professional Studies	
	Goić R., Jakus D., Penović, I., "Distribucija električne energije"	
Authorship of university/faculty	Goić R., Jakus D., Penović, I., "Električne mreže"	
	Goić R., Jakus D., "Osnove elektroenergetike"	
Professional, scholarly and artistic	1. Jakus, D; Krstulović Opara, J; Vasilj, J. ,"Algorithm for	
articles published in the last five	optimal wind power plant capacity allocation in areas	
years in the field of the course (5	with limited transmission capacity", international Transactions on Electrical Energy Systems 24, 2012	
	Hansactions on Electrical Ellergy Systems, 24, 2013.	

	<ol> <li>Jakus, D.; Goić, R.; Krstulović Opara, J., "The impact of wind power plants on slow voltage variations in distribution networks", Electric power systems research, 81, 2011.</li> <li>Goić, R.; Krstulović-Opara, J.; Jakus, D., "Simulation of aggregate wind farm short-term production variations", Renewable Energy, 35, 2010.</li> <li>Jakus, D.; Vasilj, J.; Goić, R.,"Impact of PV Power Plants on the Voltage Conditions and Power System Losses in MV Distribution Network", Proceedings of the 4th International Workshop on Integration of Solar into Power Systems, Berlin, 2014.</li> </ol>
	<ol> <li>Jakus, D.; Vasilj, J.; Tutavac, H., "Coordinated Control of Renewable Energy Sources in Distribution Networks", Proceedings of the 4th International Workshop on Integration of Solar into Power Systems, Berlin, 2014.</li> </ol>
Professional and scholarly articles published in the last five years in subjects of teaching methodology and teaching quality (5 works at most)	-
Professional, science and artistic projects in the field of the course carried out in the last five years (5 at most)	<ol> <li>Razvoj i pogon elektroenergetskog sustava s visokim udjelom vjetroelektrana – MZOŠ (scientific project)</li> <li>Studija razvoja distribucijske mreže za razdoblje narednih 20 godina za distribucijsko područje Elektre Zadar – HEP ODS d.o.o. (expert project)</li> <li>Razvoj distribucijske mreže Elektrojug Dubrovnik u razdoblju 2011-2031. godine – HEP ODS d.o.o. (expert project)</li> <li>Tehničko-okolišna dubinska analiza vjetroelektrane Lukovac - HEP Obnovljivi izvori energije d.o.o. (expert project)</li> <li>Tehničko-okolišna dubinska analiza vjetroelektrane Crno Brdo - HEP Obnovljivi izvori energije d.o.o. (expert project)</li> </ol>
The name of the programme and the volume in which the main teacher passed exams in/acquired the methodological-psychological- didactic-pedagogical group of competences?-pedagoške kompetencije?	-
PRIZES AND AWARDS, STUDENT	EVALUATION
Arrizes and awards for teaching and scholarly/artistic work Results of student evaluation taken in the last five years for the course that is comparable to the course described in the form (evaluation organizer, average grade, note on grading scale and course evaluated)	4.4/5

First and last name and title of teacher	lvica Jurić-Grgić, Ph.D., Associate Professor
The course he/she teaches in the proposed study programme	Electrical Machines and Transformers Electrical safety
GENERAL INFORMATION ON COL	JRSE TEACHER
Address	Pujanke 59. 21000 Split. Croatia
Telephone number	+385 21 305-811
E-mail address	iiuricar@fesb.hr
Personal web page	-
Year of birth	1977.
Scientist ID	248792
Research or art rank, and date of last rank appointment	Senior scientific associate, 12/7/2012
Research-and-teaching, art-and- teaching or teaching rank, and date of last rank appointment	Associate Professor, 20/9/2016
Area and field of election into research or art rank	Technical Sciences, Field Electrical engineering
INFORMATION ON CURRENT EMP	PLOYMENT
Institution where employed	Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture
Date of employment	23/9/2001
Name of position (professor, researcher, associate teacher, etc.)	Associate Professor
Field of research	Power engineering
Function	-
INFORMATION ON EDUCATION -	Highest degree earned
INFORMATION ON EDUCATION – Degree	Highest degree earned PhD
INFORMATION ON EDUCATION – Degree Institution	Highest degree earned PhD Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture
INFORMATION ON EDUCATION – Degree Institution Place	Highest degree earned PhD Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture Split
INFORMATION ON EDUCATION – Degree Institution Place Date	Highest degree earned PhD Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture Split 10/3/2008
INFORMATION ON EDUCATION – Degree Institution Place Date INFORMATION ON ADDITIONAL T	Highest degree earned PhD Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture Split 10/3/2008 RAINING
INFORMATION ON EDUCATION – Degree Institution Place Date INFORMATION ON ADDITIONAL T Year	Highest degree earned PhD Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture Split 10/3/2008 RAINING -
INFORMATION ON EDUCATION – Degree Institution Place Date INFORMATION ON ADDITIONAL T Year Place	Highest degree earned PhD Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture Split 10/3/2008 RAINING - -
INFORMATION ON EDUCATION – Degree Institution Place Date INFORMATION ON ADDITIONAL T Year Place Institution	Highest degree earned PhD Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture Split 10/3/2008 RAINING - - -
INFORMATION ON EDUCATION – Degree Institution Place Date INFORMATION ON ADDITIONAL T Year Place Institution Field of training	Highest degree earned PhD Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture Split 10/3/2008 RAINING - - - - -
INFORMATION ON EDUCATION – Degree Institution Place Date INFORMATION ON ADDITIONAL T Year Place Institution Field of training MOTHER TONGUE AND FOREIGN	Highest degree earned PhD Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture Split 10/3/2008 RAINING - - - - LANGUAGES
INFORMATION ON EDUCATION – Degree Institution Place Date INFORMATION ON ADDITIONAL T Year Place Institution Field of training MOTHER TONGUE AND FOREIGN Mother tongue	Highest degree earned PhD Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture Split 10/3/2008 RAINING - - - - LANGUAGES Croatian
INFORMATION ON EDUCATION – Degree Institution Place Date INFORMATION ON ADDITIONAL T Year Place Institution Field of training MOTHER TONGUE AND FOREIGN Mother tongue Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	Highest degree earned PhD Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture Split 10/3/2008 RAINING - - - LANGUAGES Croatian English (4)
INFORMATION ON EDUCATION – Degree Institution Place Date INFORMATION ON ADDITIONAL T Year Place Institution Field of training MOTHER TONGUE AND FOREIGN Mother tongue Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	Highest degree earned PhD Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture Split 10/3/2008 RAINING LANGUAGES Croatian English (4)
INFORMATION ON EDUCATION – Degree Institution Place Date INFORMATION ON ADDITIONAL T Year Place Institution Field of training MOTHER TONGUE AND FOREIGN Mother tongue Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent) COMPETENCES FOR THE COURS	Highest degree earned PhD Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture Split 10/3/2008 RAINING - - - - LANGUAGES Croatian English (4)
INFORMATION ON EDUCATION – Degree Institution Place Date INFORMATION ON ADDITIONAL T Year Place Institution Field of training MOTHER TONGUE AND FOREIGN Mother tongue Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent) COMPETENCES FOR THE COURS Earlier experience as course teacher of similar courses (name title of course, study programme where it is/was offered, and level of study programme)	Highest degree earned         PhD         Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture         Split         10/3/2008         RAINING         -
INFORMATION ON EDUCATION – Degree Institution Place Date INFORMATION ON ADDITIONAL T Year Place Institution Field of training MOTHER TONGUE AND FOREIGN Mother tongue Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent) COMPETENCES FOR THE COURS Earlier experience as course teacher of similar courses (name title of course, study programme where it is/was offered, and level of study programme) Authorship of university/faculty textbooks in the field of the course	Highest degree earned         PhD         Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture         Split         10/3/2008         RAINING         -         -         -         -         -         -         -         -         -         English (4)         SE         Electrical Machines 1, Graduate study programme.         Testing of electrical installation, Graduate study programme.         Electrical safety, Undergraduate study programme.         -
INFORMATION ON EDUCATION – Degree Institution Place Date INFORMATION ON ADDITIONAL T Year Place Institution Field of training MOTHER TONGUE AND FOREIGN Mother tongue Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent) COMPETENCES FOR THE COURS Earlier experience as course teacher of similar courses (name title of course, study programme where it is/was offered, and level of study programme) Authorship of university/faculty textbooks in the field of the course Professional, scholarly and artistic	Highest degree earned         PhD         Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture         Split         10/3/2008         RAINING         -         English (4)         SE         Electrical Machines 1, Graduate study programme.         Testing of electrical installation, Graduate study programme.         Electrical safety, Undergraduate study programme.         -         •         Jurić-Grgić, I.; Lucić, R.; Dabro, M.: "A coupled

years in the field of the course (5 works at most)	<ul> <li>International Transactions on Electrical Energy Systems, Vol.23 (8), 2013, pp. 1365–1372.</li> <li>Lucić, R.; Jurić-Grgić, I.; Balaž, Z.: " Grounding grid transient analysis using the improved transmission line model based on the finite element method", ETEP: European Transactions on Electrical Power, Vol.23 (2), 2013, pp. 282–289.</li> <li>Dabro, M.; Jurić-Grgić, I.; Martinović, M.: "Improvement of Synchronous Generator Power Stability Using Hydraulic Digital Governor", International Journal on Engineering Applications (IREA), Vol. 1 (5), 2013, pp. 263-267.</li> <li>Dabro, M.; Jurić-Grgić, I.; Lucić, R.: "Optimization of Hydraulic Digital Governor parameters using EMTP- RV", International Journal on Engineering Applications (IREA), Vol. 1 (2), 2013, pp. 90-93.</li> <li>Dabro, M.; Jurić-Grgić, I.; Lucić, R.: "EMTP-RV Model of Hydraulic Digital Governor", International Review on Modelling and Simulations (IREMOS), Vol. 4 (6), 2011, pp. 1-5.</li> </ul>
Professional and scholarly articles published in the last five years in	
and teaching quality (5 works at most)	-
Professional, science and artistic projects in the field of the course carried out in the last five years (5 at most)	<ul> <li>Study: Elaborat iznošenja potencijala i izračun napona dodira i koraka za EVP 110/25 kV Novska, Naručitelj: Projektni biro Split, 2010.</li> <li>Project: 023 0231581-1610, "Numeričko modeliranje elektroenergetskog sustava tehnikom konačnih elemenata", br. 023 0231581-1610, Ministarstvo znanosti, obrazovanja i športa Republike Hrvatske, 20072011.</li> <li>Study: Izrada pravila i mjera sigurnosti za osiguranje mjesta rada na elektroenergetskim vodovima, Naručitelj: HEP OPS d.o.o., Prijenosno područje Split, 2013.</li> </ul>
The name of the programme and the volume in which the main teacher passed exams in/acquired the methodological-psychological-	-
didactic-pedagogical group of competences?-pedagoške kompetencije?	
PRIZES AND AWARDS, STUDENT	EVALUATION
Prizes and awards for teaching	-
and scholarly/artistic work Results of student evaluation	
taken in the last five years for the	
course that is comparable to the	-
(evaluation organizer, average	
grade, note on grading scale and	
course evaluated)	

First and last name and title of teacher	Tomislav Kilić, Ph.D., Full Professor
The course he/she teaches in the proposed study programme	Electrical Measurements Fundamentals of Electrical Engineering 1
GENERAL INFORMATION ON COL	JRSE TEACHER
Address	Put borika 17, 21000 Split, HR
Telephone number	+385 21 305733
E-mail address	tkilic@fesb.hr
Personal web page	
Year of birth	1961.
Scientist ID	142496
Research or art rank, and date of	Crientific Articon 0/7/0000
last rank appointment	Scientific Adviser, 9/7/2009
Research-and-teaching, art-and-	
teaching or teaching rank, and	Senior Full Professor, 18/9/2014
date of last rank appointment	
Area and field of election into	Technical Sciences, Field Electrical engineering
research or art rank	
INFORMATION ON CURRENT EMP	PLOYMENT
Institution where employed	Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture
Date of employment	1/10/1987
Name of position (professor, researcher, associate teacher, etc.)	Professor
Field of research	Electrical Measurement, Power Quality
Function	Head of Chair of Electrical Measurement
INFORMATION ON EDUCATION -	Highest degree earned
Degree	PhD
Institution	Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture
Place	Split
Date	9/11/2001
INFORMATION ON ADDITIONAL T	RAINING
Year	1996
Place	Toronto, Canada
Institution	GEM Systems
Field of training	Research and development of instruments for magnetic field measurement
MOTHER TONGUE AND FOREIGN	LANGUAGES
Mother tongue	Croatian
Foreign language and command of	
foreign language on a scale from 2 (sufficient) to 5 (excellent)	English (4)
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	Italian (2)
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	
COMPETENCES FOR THE COURS	E

Earlier experience as course teacher of similar courses (name title of course, study programme where it is/was offered, and level of study programme)	Fundamentals of Electrical Engineering, Undergraduate study programme, Electrical Measurements, Undergraduate study programme
Authorship of university/faculty textbooks in the field of the course	Kilić, Tomislav: Električna mjerenja - upute za laboratorijske vježbe, Skripta, FESB Split, ISBN 953-6114-62-3, Split, 2003.
Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)	<ol> <li>Petrović, Goran; Kilić, Tomislav; Garma, Tonko. Measurement and Estimation of the Extremely Low Frequency Magnetic Field of the Overhead Power Lines. // Journal Elektronika ir elektrotechnika. 19 (2013), 7; 33- 36.</li> <li>Kovač, Nikša; George, J. Anders; Tomislav Kilić. Sheath Loss Factors Taking Into Account the Proximity Effect for Cable Lineand Touching Flat Formation. // IEEE Transactions on Power Delivery, 30 (2015), 3, 1363- 1371.</li> </ol>
Professional and scholarly articles published in the last five years in subjects of teaching methodology and teaching quality (5 works at most)	1. Marian-Silviu Poboroniuc, Gheorghe Livint, F. Maciel Barbosa, Wojciech Mysiński, Anna Friesel, Bahar Karaoglan, Yoana Ruseva, Dorin Popescu, Tomislav Kilic, Tony Ward, Noel Jackson, Ian Grout: <i>Developing</i> <i>New Electrical and Information Engineering Related</i> <i>Curricula to Respond to the Actual Global Challenges</i> , EAEEIE 2015, Denmark
Professional, science and artistic projects in the field of the course carried out in the last five years (5 at most)	<ol> <li>HRZZ Istraživački projekt: Mjeriteljska infrastruktura za pametne mreže, 2015 2018.</li> <li>LLP - ERASMUS: Strategic Alignment of Electrical and Information Engineering in European Higher Education Institutions, 20122014.</li> <li>TEMPUS: Creation of the third cycle studies-doctoral studies in metrology Trajanje projekta: 2010. – 2013.</li> </ol>
The name of the programme and the volume in which the main teacher passed exams in/acquired the methodological-psychological- didactic-pedagogical group of competences?-	
PRIZES AND AWARDS, STUDENT	EVALUATION
Prizes and awards for teaching and scholarly/artistic work	
Results of student evaluation taken in the last five years for the course that is comparable to the course described in the form (evaluation organizer, average grade, note on grading scale and course evaluated)	4,8/5

First and last name and title of teacher	Josip Lörincz, Ph.D., Assistant Professor
The course he/she teaches in the proposed study programme	Electrotechnical materials and technologies
GENERAL INFORMATION ON CO	URSE TEACHER
Address	FESB, R. Boškovića 32, 21000 Split, Croatia
Telephone number	0914305665
E-mail address	josip.lerinc@fesb.hr
Personal web page	http://www.josip-lorincz.com
Year of birth	1978.
Scientist ID	272921
Research or art rank, and date of last rank appointment	Scientific advisor, February 2013.
Research-and-teaching, art-and-	
teaching or teaching rank, and date of last rank appointment	Assistant professor (docent), December 2011.
Area and field of election into	Area: electrical engineering, field: telecommunications and
research or art rank	Informatics
INFORMATION ON CURRENT EM	IPLOYMENT
Institution where employed	Faculty of electrical engineering, mechanical engineering and naval architecture (FESB), University of Split
Date of employment	October 1, 2003.
Name of position (professor,	
researcher, associate teacher,	Assistant professor
etc.)	
	<ul> <li>Information and communication technologies,</li> </ul>
	• Computing,
Field of research	• Electrical engineering,
	I elecommunications and informatics,
	Energy-efficient networking and computing,
Function	Optimization in telecommunications.
Function	
INFORMATION ON EDUCATION -	- Highest degree earned
Degree	Ph. D. in electrical engineering, University of Split, FESB-Split, 2010
Institution	Faculty of electrical engineering, mechanical engineering and naval architecture (FESB), University of Split
Place	Split, Croatia
Date	June 2010.
INFORMATION ON ADDITIONAL	TRAINING
Year	2009-2010
Place	Milano, Italy
Institution	Politecnico di Milano
Field of training	Doctoral research visit
	0000 0000
Year	2003, 2009 Split and Zagrab, Creatia
Institution	Split and Zagreb, Croatia
mouluum	Professional specialisation for instructor of international CCNA
Field of training	(Cisco Certified Network Associate) i CCNP (Cisco Certified
	Network Professional) program
MOTHER TONGLIE AND EOPEIC	N LANGUAGES
Mother tongue	Croatian
Foreign language and command	
of foreign language on a scale	English - Excellent (5)
from 2 (sufficient) to 5 (excellent)	<u> </u>

Foreign language and command of foreign language on a scale	Italian – sufficient (2)			
from 2 (sufficient) to 5 (excellent)				
COMPETENCES FOR THE COURSE				
Earlier experience as course teacher of similar courses (name title of course, study programme where it is/was offered, and level of study programme)	<ul> <li>Introduction of new curriculum:</li> <li>Introduction of new course on graduate study: Network and mobile operating systems, Ships local computer networks</li> <li>Introduction of completely new laboratory exercises for next courses on graduate study: Network and mobile operating systems, Local and access networks, Ships local computer networks</li> <li>Extension of existing laboratory exercises with new content for next courses on graduate study: Wireless communication networks, IP communications, Engineering graphics and presentation</li> </ul>			
	Establishment and organization of new faculty laboratories:			
	<ul> <li>Participation in establishment and development of new Laboratory for network technologies of Cathedra of communication technologies and signal processing on FESB, University of Split.</li> </ul>			
	Authorship of internal teaching materials:			
Authorship of university/faculty textbooks in the field of the course	<ul> <li>Internal script: Network and mobile operating systems</li> <li>Internal script: Local and access networks</li> <li>Internal script: Ships local computer networks</li> <li>Internal script: Ships local computer networks</li> </ul> Authorship of internal laboratory exercise manuals: <ul> <li>Manual for laboratory exercise: Network and mobile operating systems</li> <li>Manual for laboratory exercise: Wireless communication networks</li> <li>Manual for laboratory exercise: Local and access networks</li> <li>Manual for laboratory exercise: Local and access networks</li> <li>Manual for laboratory exercise: Engineering graphics and presentation</li> </ul>			
Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)	<ul> <li>Scientific Monography (book): Josip Lorincz, "Optimizing energy consumption of wireless access networks", Lambert Academic Publishing, Germany, 2012, str. 210</li> <li>Scientific papers published in international scientific journals: <ol> <li>Chiaraviglio, Luca; Cuomo, Francesca; Maisto, Maurizio; Gigli, Andrea; Lorincz, Josip; Zhou, Yifan; Zhao, Zhifeng; Qi, Chen; Zhang, Honggang, Which is the Best Spatial Distribution to Model Base Station Density? A Deep Dive in Two European Mobile Networks, <i>IEEE Access</i>, Vol.: 4 (2016), p.p. 1434-1443</li> <li>J. Lorincz, L. Chiaraviglio, F. Cuomo, A Measurement Study of Short-time Cell Outages in Mobile Cellular</li> </ol> </li> </ul>			

Networks, Computer communications, Vol.: <b>79</b> (2016), p.p.: 92-102
<b>3.</b> L. Chiaraviglio, P. Wiatr, P. Monti, J. Chen, J. Lorincz, F. Idzikowski, M. Listanti, L. Wosinska, <i>"Is Green Networking Beneficial in Terms of Device Lifetime?"</i> , IEEE Communications Magazine, Volume: 53, Issue: 5, 2015, p.p.: 232-240
<b>4.</b> J. Lorincz, I. Bule, M. Kapov, <i>"Performance Analyses of Renewable and Fuel Power Supply Systems for Different Base Station Sites"</i> , Energies journal, Volume: 7 Issue:12, 2014, p.p.: 7816 – 7846
<b>5.</b> J. Lorincz, T. Matijevic, G. Petrovic, "On <i>interdependence among transmit and consumed power of macro base station technologies",</i> Computer communications (ISSN: 0140-3664), Volume (issue): 50 (2014), p.p.: 10-28
<b>6.</b> J. Lorincz, T. Matijevic, " <i>Energy-efficiency analyses of heterogeneous macro and micro base station sites</i> ", Computers and Electrical Engineering (ISSN: 0045-7906), Volume: 40, Issue: 2, 2014, p.p.: 330-349
<b>7.</b> J. Lorincz, I. Cubic, T. Matijevic, <i>"Adaptive and Resilient Solutions for Energy Savings of Mobile Access Networks"</i> , International Journal of Adaptive, Resilient and Autonomic Systems (IJARAS), Svezak: 5, Broj: 3, 2014, p.p.: 82-102
<b>8.</b> J. Lorincz, Energy-efficient wireless cellular communications through network resource dynamic adaptation, International Journal of Business Data Communications and Netwrking (IJBDCN), Svezak: 9, broj: 2, 2013, p.p.: 1-14
<b>9.</b> J. Lorincz, I. Bule, "Renewable energy sources for power supply of base station sites", International Journal of Business Data Communications and Netwrking (IJBDCN), Svezak: 9, broj: 3, 2013, p.p.: 53-74
<b>10.</b> J. Lorincz, A. Capone, D. Begusic, " <i>Impact of service rates and base station switching granularity on energy consumption of cellular networks</i> ", EURASIP Journal on Wireless Communications and Networking (ISSN: 1687-1499), Volume (issue): 2012 (342), 2012, p.p.: 1-24
<b>11.</b> J. Lorincz, T. Garma, G. Petrovic, " <i>Measurements and Modelling of Base Station Power Consumption under Real Traffic Loads</i> ", Sensors Journal (ISSN: 1424-8220), Volume 12, Issue: 4, travanj 2012, p.p.: 4281-4310.
<b>12.</b> J. Lorincz, A. Capone, D. Begušić, " <i>Heuristic Algorithms for Optimization of Energy Consumption in Wireless Access Networks</i> ", KSII Transactions on Internet

and Information Systems (ISSN: 1976-7277), Volume: 5, Issue: 5, 2011., p.p.: 514-540
<b>13.</b> J. Lorincz, A. Capone, D. Begušić, " <i>Optimized Network Management for Energy Savings of Wireless Access Networks</i> ", Computer Networks Journal (ISSN: 1389-1286), Volume: 55, Issue: 2011, p.p.: 626-648
<ul> <li>Scientific papers published on international scientific conferences with international review:</li> <li>1. Luca Chiaraviglio, Josip Lorincz, Paolo Monti, "Towards Luca Chiaraviglio, Marco Listanti, Josip Lorincz, Edoardo Manzia, Martina Santucci, "Modelling the Impact of Power State Transitions on the Lifetime of Cellular Networks", Proceedings of the 2015 IEEE 82nd Vehicular Technology Conference – Fall (IEEE VTC2015-Fall), 0609.09.2015, Boston, SAD, p.p.: 1-5 (ISSN: 978-1-4799-8090-1)</li> <li>2. Luca Chiaraviglio, Josip Lorincz, Paolo Monti, "Towards Sustainable and Reliable Networks with LIFETEL", Proceedings of the IEEE Conference on Computer Communications - INFOCOM 2015, 26.41.5.2015, Hong Kong, China, p.p.: 39-40, (ISSN: 978-1-4673-7131-5)</li> <li>3. Lorincz Josip, Mujaric Eldis, Begusic Dinko, "Energy consumption analysis of real metro-optical network", Proceedings of the 38<sup>th</sup> International Conference on Information and Communication Technologies, Electronics and Microelectronics (MIPRO2015), 2529.5.2015.,</li> </ul>
<ul> <li>Opatija, Croatia, p.p.: 621-626., (ISSN: 978-953-233-083- 0)</li> <li>4. L. Chiaraviglio, P. Wiatr, P. Monti, J. Chen, L Wosinska, L. Lorincz, F. Idzikowski, M. Listanti, "Impact of Energy- Efficient Techniques on a Device Lifetime", Proceedings of the IEEE Online Conference on Green Communications (GreenCom 2014), 12. – 14.11.2014., On-line conference,</li> </ul>
<ul> <li>p.p.: 1-6.</li> <li>Luca Chiaraviglio, Josip Lorincz, "The Impact of Sleep Modes on the Lifetime of Cellular Networks", The 22nd International Conference on Software, Telecommunications and Computer Networks (SoftCOM 2014), Proceedings of the 22nd International Conference on Software, Telecommunications and Computer Networks (SoftCOM 2014), 17-19. 9. 2014, Split, Croatia, p.p.: 1-5, (ISSN: 978- 953-290-051-4)7</li> </ul>
<ol> <li>Luca Chiaraviglio, Antonio Cianfrani, Angelo Coiro, Marco Listanti, Josip Lorincz, Marco Polverini, "Increasing Device Lifetime in Backbone Networks with Sleep Modes", The 21st International Conference on Software, Telecommunications and Computer Networks (SoftCOM 2013), 1820.09.2013, Primošten, Croatia, Proceedings of the 21st International Conference on Software,</li> </ol>

	Telecommunications and Computer Networks (SoftCOM					
	2013), p.p.: 1-6, (ISSN: 978-953-290-041-5)					
Professional and scholarly articles published in the last five years in subjects of teaching methodology and teaching quality (5 works at most)	Book: 1. Domagoj Babić, Zvonimir Rakamarić, Josip Lorincz, "A guide for postgraduate study in foreign countries", P.O.I.N.T. Križevci, Croatia, 2012, p.p.: 100					
Professional, science and artistic projects in the field of the course carried out in the last five years (5 at most)	<ul> <li>Participation in international scientific projects as project coordinator: <ul> <li>Green networking (HZZ- Croatian Science Foundation)</li> <li>Doctoral research visit on green networking project (UKF – Unity Through Knowledge Fund))</li> </ul> </li> <li>Participation in international scientific projects as project researcher: <ul> <li>Establish Pan-European Information Space to Enhance seCurity of Citizens – EPISECC (EU FP7: Work programme 2013, Cooperation, Theme 10: Security)</li> <li>Increasing the LIFEtime of TELecommunication networks (LIFETEL) – University of Rome (La Sapienza)</li> </ul> </li> <li>Participation in domestic education projects as project participant: <ul> <li>Modernising doctoral education through implementation of Croatian qualification framework (MODOC) – EU IPA program BGUE 04 06, Human resources development</li> </ul> </li> </ul>					
The name of the programme and the volume in which the main teacher passed exams in/acquired the methodological- psychological-didactic- pedagogical group of competences?	<ul> <li>Modernising doctoral education through implementation of Croatian qualification framework (MODOC) – EU IPA program BGUE 04 06, Human resources development</li> <li>Participation in workshop dedicated to the development of methodological-psychological-didactic-pedagogical competences.</li> </ul>					
PRIZES AND AWARDS, STUDEN	Γ EVALUATION					
Prizes and awards for teaching and scholarly/artistic work	<ul> <li>Yearly award of Okrug County for scientific/research work and promotion of science in 2013.</li> <li>Award of Faculty of electrical engineering, mechanical engineering and naval architecture (FESB) for the notable scientific and research results in 2013.</li> <li>Award "Vera Johanides" for 2012. of Croatian Academy of engineering (Academia Scientiarum Tehnicarum Croatica)</li> <li>Award of Faculty of electrical engineering, mechanical engineering and naval architecture (FESB) to the most successful scientific novices in 2011.</li> </ul>					
Results of student evaluation taken in the last five years for the course that is comparable to the	Evaluation organi engineering, mech (FESB). Note on grading s on scale 1-5 Course/average grade	izer: Univ anical en scale: glo Global index 2011/12	versity of gineering bal index Global index 2012/13	Split, Fac and nav evaluati Global index 2013/14	culty of el al archite ng overal Global index 2014/15	ectrical ecture I course Global index 2015/16

course described in the form (evaluation organizer, average grade, note on grading scale and course evaluated)	Network and mobile operating systems	4,3	3,3	3,9	4,5	4,1
	Local and access networks	4,8	4,4	4,00	4,2	/
	Electrotechnical materials and technologies	4,7	/	4,6	/	4,5

First and last name and title of teacher	Rino Lucić, Ph.D., Full Professor
The course he/she teaches in the	
proposed study programme	Electrical installations
GENERAL INFORMATION ON COL	IRSE TEACHER
Address	Split, Duplančića dvori 3
Telephone number	091/ 4 305 611
E-mail address	Rino.Lucic@fesb.hr
Personal web page	-
Year of birth	1957
Scientist ID	154916
Research or art rank, and date of	Scientific Adviser 18/1/2010
last rank appointment	
Research-and-teaching, art-and-	
teaching or teaching rank, and	Senior Full Professor, 18/1/2016
date of last rank appointment	
Area and field of election into	Technical Sciences, Field Electrical engineering
	LOTMENT
Institution where employed	Faculty of Electrical Engineering, Mechanical Engineering and
Data of amployment	
Date of employment	25/9/1987
Name of position (professor,	Drofossor
researcher, associate teacher,	Professor
Field of research	Numerical modeling of electromagnetic fields and transients
Function	
Degree	PIID Executiv of Electrical Engineering, Mechanical Engineering and
Institution	Naval Architecture
Place	Split
Date	16/09/1999
INFORMATION ON ADDITIONAL T	RAINING
Year	1992
Place	Swansea (GB)
Institution	The University College of Swansea University of Walles
Field of training	Numerical modeling of electromagnetic fields
Year	2001./ 2002.
Place	Amiens, San Quentin (France)
Institution	The University of P Picardie
Field of training	Numerical modeling of electrical machines by the finite
Field of training	element method and by permeance network method
MOTHER TONGUE AND FOREIGN	LANGUAGES
Mother tongue	Croatian
Foreign language and command of	
foreign language on a scale from 2	English (4)
(sufficient) to 5 (excellent)	
Foreign language and command of	
toreign language on a scale from 2	
(sufficient) to 5 (excellent)	
Foreign language and command of	
toreign language on a scale from 2	
COMPETEINCES FOR THE COURS	E
Earlier experience as course	Electrical safety (Undergraduate study programme), FESB
teacher of similar courses (name	Electrical salety (undergraduate study programme), FESB

title of course, study programme where it is/was offered, and level of study programme)	Electrical installations testing (graduate study programme),FESB Marine electrical systems (vocational study programme MCAST-Malta) Electrical technology (vocational study programme MCAST- Malta)
Authorship of university/faculty textbooks in the field of the course	-
Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)	<ol> <li>R. Lucić, et al. ' Grounding grid transient analysis using the improved transmission line model based on the finite element method', Int. Trans. on El. Energy Systems, 2013.</li> <li>S. Vujević, R. Lucić, et. al. 'Creating rules and safety measures to ensure the place of work on power lines', Study report for HEP OPS, Split, 2013.</li> </ol>
Professional and scholarly articles published in the last five years in subjects of teaching methodology and teaching quality (5 works at most)	
Professional, science and artistic projects in the field of the course carried out in the last five years (5 at most)	Project MZOŠ 023-0000000-3271 Project MZOŠ 023-0231581-1610 IPA project 'Professional development programs for MCAST students and lecturers', Malta, 2011/2012.
The name of the programme and the volume in which the main teacher passed exams in/acquired the methodological-psychological- didactic-pedagogical group of competences?-pedagoške kompetencije?	
PRIZES AND AWARDS, STUDENT	EVALUATION
Prizes and awards for teaching and scholarly/artistic work	
Results of student evaluation taken in the last five years for the course that is comparable to the course described in the form (evaluation organizer, average grade, note on grading scale and course evaluated)	

First and last name and title of teacher	Ivan Marasović, Ph.D. Assistant Professor
The course he/she teaches in the proposed study programme	Electronic Instrumentation
GENERAL INFORMATION ON COL	IRSE TEACHER
Address	Jurja Šižgorića 14, 21000 Split
Telephone number	+385 21 305826
E-mail address	Ivan Marasovic@fesb.hr
Personal web page	
Year of birth	1983.
Scientist ID	297561
Research or art rank, and date of last rank appointment	Assistant research fellow, 07.07.2015.
Research-and-teaching, art-and- teaching or teaching rank, and date of last rank appointment	Assitant professor, 01.10.2015.
Area and field of election into research or art rank	Technical Sciences, Field electrical Engineering, Branch
INFORMATION ON CURRENT FMF	PLOYMENT
	Eaculty of Electrical Engineering, Mechanical Engineering and
Institution where employed	Naval Architecture
Date of employment	01/09/2007
Name of position (professor, researcher, associate teacher, etc.)	Professor
Field of research	Electronics, Micro and nano electronics, Solar cells and photovoltaics, Embedded systems
Function	
INFORMATION ON EDUCATION -	Highest degree earned
Degree	PhD
Institution	Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture
Place	Split
Date	11/05/2012
INFORMATION ON ADDITIONAL T	RAINING
Year	2011. (1 weeks)
Place	Freiburg, Germany
Institution	Fraunhofer ISE
Field of training	Photovoltaics
Year	2011. (2 weeks)
Place	Ljubaljana, Slovenia
Institution	Fakultet za elektrotehniko
Field of training	Semiconductor nanoelectronics
MOTHER TONGUE AND FOREIGN	LANGUAGES
Mother tongue	Croatian
Foreign language and command of	
foreign language on a scale from 2 (sufficient) to 5 (excellent)	English (4)
Foreign language and command of	
foreign language on a scale from 2	
(sufficient) to 5 (excellent)	
Foreign language and command of	
foreign language on a scale from 2	
(sufficient) to 5 (excellent)	
COMPETENCES FOR THE COURS	
Earlier experience as course	Electronic devices and circuits, Undergraduate study of
teacher of similar courses (name	Electrical Engineering and Information Technology
title of course, study programme	Basic electronics, Undergraduate study in Computing

where it is/was offered, and level of study programme)	Digital instrumentation 1, Undergraduate study of Control Engineering and Automation, Electronic and Computer Engineering and Communication		
Authorship of university/faculty textbooks in the field of the course			
Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)	<ol> <li>L. Mainetti, I. Marasović, L. Patrono, P. Šolić, M.L. Stefanizzi, R. Vergallo "A Novel IoT-aware Smart Parking System based on the integration of RFID and WSN technologies., (2016), 833257</li> <li>I. Marasović, Ž. Milanović, I. Zulim, "Modelling and detection of failure in medical electrodes", (2015), 789296</li> <li>S. Nižetić, I. Marasović, D. Čoko, "Experimental study on a hybrid energy system with small-and medium-scale applications for mild climates., (2014), 694087</li> <li>I. Marasović, Ž. Milanović, T. Betti, "Resistance Fluctuations in GaAs Nanowire Grids", Journal of Nanomaterials, (2014), 428390</li> <li>I. Marasović, T. Garma, T. Betti, "Modelling a nanowire grid for light-sensing applications", Journal of Physics D: Applied Physics 45 (2012)</li> </ol>		
Professional and scholarly articles published in the last five years in subjects of teaching methodology and teaching guality (5 works at			
most)			
Professional, science and artistic projects in the field of the course carried out in the last five years (5 at most)			
The name of the programme and the volume in which the main teacher passed exams in/acquired the methodological-psychological- didactic-pedagogical group of competences?-pedagoške kompetencije?			
PRIZES AND AWARDS, STUDENT	EVALUATION		
Prizes and awards for teaching and scholarly/artistic work			
Results of student evaluation taken in the last five years for the course that is comparable to the course described in the form (evaluation organizer, average grade, note on grading scale and course evaluated)	4,0		

The course he/she teaches in the proposed study programme         Mathematics, Applied mathematics           GENERAL INFORMATION ON COURSE TEACHER         Address         FESB, R. Boškovića 32, B801           Address         FESB, R. Boškovića 32, B801         Telephone number         021 305891           E-mail address         Ivancica.Mirosevic@fesb.hr         Personal web page         9           Year of birth         1973         5         5           Scientist ID         248845         248845           Research or art rank, and date of last rank appointment         Lecturer, since 2011         4           Area and field of election into research or art rank         Area od Natural Sciences, Field of Mathematics           INFORMATION ON CURRENT EMPLOYMENT         Institution where employed         FESB, Split           Date of employment         2001         2001         Name of position (professor, research, etc.)           Field of research         Mathematics         Function         Institution           INFORMATION ON EDUCATION – Highest degree earned         Degree         Mr. sc.           Function         University of Zagreb, Faculty of Natural Sciences and Mathematics, Place         Zagreb, Croatia           Date         Zagreb, Croatia         Zagreb, Croatia         Zagreb, Croatia	The course he/she teaches in the proposed study programme       Mathematics, Applied mathematics         GENERAL INFORMATION ON COURSE TEACHER       Address       FESB, R. Boškovića 32, B801         Telephone number       021 305891       Email address         Personal web page       Vrancica.Mirosevic@fesb.hr         Year of birth       1973         Scientist ID       248845         Research or art rank, and date of last rank appointment       Ecturer, since 2011         Area and field of election into research or art rank       Area od Natural Sciences, Field of Mathematics         NFORMATION ON CURRENT EMPLOYMENT       Institution where employed         Institution of professor, researcher, associate teacher, etc.)       Lecturer         Field of research       Mathematics         Field of research       Mathematics         Field of research       Lecturer         Institution where employed       FESB, Split         Date of employment       2001         NAme of position (professor, researcher, associate teacher, etc.)       Lecturer         Field of research       Mathematics	First and last name and title of teacher	Ivančica Mirošević, M.Sc., Lectuter
proposed study programme         Mathematics, Applied mathematics           GENERAL INFORMATION ON COURSE TEACHER           Address         FESB, R. Boškovića 32, B801           Telephone number         021 305891           E-mail address         Ivancica. Mirosevic@fesb.hr           Personal web page         1973           Scientist ID         248845           Research or art rank, and date of last rank appointment         248845           Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment         Area od Natural Sciences, Field of Mathematics           Area and field of election into research or art rank         Area od Natural Sciences, Field of Mathematics           INFORMATION ON CURRENT EMPLOYMENT         2001           Name of position (professor, researcher, associate teacher, etc.)         Lecturer           Field of research         Mathematics           Function         University of Zagreb, Faculty of Natural Sciences and Mathematics, Place           Degree         Mr. sc.           Place         Zagreb, Croatia           Date of research         Mathematics	proposed study programme         Mathematics, Applied mathematics           GENERAL INFORMATION ON COURSE TEACHER           Address         FESB, R. Boškovića 32, 8801           Telephone number         021 305891           E-mail address         Ivancica.Mirosevic@fesb.hr           Personal web page	The course he/she teaches in the	Martha and the Arabita has all a second as
GENERAL INFORMATION ON COURSE TEACHER         Address       FESB, R. Boškovića 32, B801         Telephone number       021 305891         E-mail address       Ivancica.Mirosevic@fesb.hr         Personal web page       Ivancica.Mirosevic@fesb.hr         Year of birth       1973         Scientist ID       248845         Research or art rank, and date of last rank appointment       Lecturer, since 2011         Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment       Area od Natural Sciences, Field of Mathematics         INFORMATION ON CURRENT EMPLOYMENT       Institution where employed       FESB, Split         Date of employment       2001       Lecturer         Name of position (professor, researcher, associate teacher, etc.)       Lecturer         Field of research       Mathematics         Function       Inversity of Zagreb, Faculty of Natural Sciences and Mathematics,         Place       Zagreb, Croatia         Date       Zagreb, Croatia         Degree       Mr. sc.	GENERAL INFORMATION ON COURSE TEACHER         Address       FESB, R. Boškovića 32, B801         Telephone number       021 305891         E-mail address       Ivancica.Mirosevic@fesb.hr         Personal web page       1973         Scientist ID       248845         Research or art rank, and date of last rank appointment       248845         Area and field of election into research or art rank       Lecturer, since 2011         Area and field of election into research or art rank       Area od Natural Sciences, Field of Mathematics         INFORMATION ON CURRENT EMPLOYMENT       Institution where employed         Institution where employed       FESB, Split         Date of position (professor, researcher, associate teacher, etc.)       Lecturer         Field of research       Mathematics         Function       University of Zagreb, Faculty of Natural Sciences and Mathematics,         Place       Zagreb, Croatia         Date       2005         INFORMATION ON ADDITIONAL TRAINING       Year         Year       Year	proposed study programme	Mathematics, Applied mathematics
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Telephone number021 305891E-mail addressIvancica.Mirosevic@fesb.hrPersonal web page	Telephone number       021 305891         E-mail address       Ivancica.Mirosevic@fesb.hr         Personal web page	Address	FESB, R. Boškovića 32, B801
E-mail address       Ivancica.Mirosevic@fesb.hr         Personal web page       1973         Year of birth       1973         Scientist ID       248845         Research or art rank, and date of last rank appointment       248845         Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment       Lecturer, since 2011         Area and field of election into research or art rank       Area od Natural Sciences, Field of Mathematics         INFORMATION ON CURRENT EMPLOYMENT       Institution where employed         Institution where employed       FESB, Split         Date of ensearch       Lecturer         Field of research       Lecturer         Function       INFORMATION ON EDUCATION – Highest degree earned         Degree       Mr. sc.         Institution       University of Zagreb, Faculty of Natural Sciences and Mathematics,         Place       Zagreb, Croatia         Date       2005	E-mail address       Ivancica.Mirosevic@fesb.hr         Personal web page       1973         Year of birth       1973         Scientist ID       248845         Research or art rank, and date of last rank appointment       248845         Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment       Lecturer, since 2011         Area and field of election into research or art rank       Area od Natural Sciences, Field of Mathematics         INFORMATION ON CURRENT EMPLOYMENT       Institution where employed         Institution where employed       FESB, Split         Date of employment       2001         Name of position (professor, researcher, associate teacher, etc.)       Lecturer         Field of research       Mathematics         Function       University of Zagreb, Faculty of Natural Sciences and Mathematics, Place         Institution       2agreb, Croatia         Date       2005         INFORMATION ON ADDITIONAL TRAINING       2005	Telephone number	021 305891
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(sufficient) to 5 (excellent)	Field of training       MOTHER TONGUE AND FOREIGN LANGUAGES       Mother tongue     Croatian       Foreign language and command of foreign language on a scale from 2     English (4)	(sufficient) to 5 (excellent)	
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foreign language on a scale from 2	Field of training         MOTHER TONGUE AND FOREIGN LANGUAGES         Mother tongue       Croatian         Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)       English (4)         Foreign language and command of foreign language on a scale from 2       English (4)	(sufficient) to 5 (excellent)	
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foreign language on a scale from 2 (sufficient) to 5 (excellent)         Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)         COMPETENCES FOR THE COURSE         Earlier experience as course teacher of similar courses (name title of course, study programme         Lecturer of various courses since 2001	Held of training         MOTHER TONGUE AND FOREIGN LANGUAGES         Mother tongue       Croatian         Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)       English (4)         Foreign language and command of foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)       English (4)         Foreign language on a scale from 2 (sufficient) to 5 (excellent)       English (4)         Foreign language and command of foreign language and command of foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)       English (4)         COMPETENCES FOR THE COURSE       Earlier experience as course teacher of similar courses (name title of course, study programme       Lecturer of various courses since 2001	where it is/was offered, and level	
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Field of training		Field of training	
MOTHER TONGUE AND FOREIGN LANGUAGES	Field of training	MOTHER TONGUE AND FOREIGN	LANGUAGES
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Mother tongue Croatian	MOTHER TONGUE AND FOREIGN LANGUAGES	Mother tongue	Croatian
Foreign language and command of	Field of training       MOTHER TONGUE AND FOREIGN LANGUAGES       Mother tongue     Croatian	Foreign language and command of	
foreign language on a scale from 2 English (4)	Field of training       MOTHER TONGUE AND FOREIGN LANGUAGES       Mother tongue     Croatian       Foreign language and command of	foreign language on a scale from 2	English (4)
(sufficient) to 5 (excellent)	Field of training       Field of training         MOTHER TONGUE AND FOREIGN LANGUAGES       Croatian         Mother tongue       Croatian         Foreign language and command of foreign language on a scale from 2       English (4)	(sufficient) to 5 (excellent)	
Foreign language and command of	Field of training         MOTHER TONGUE AND FOREIGN LANGUAGES         Mother tongue       Croatian         Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)       English (4)	Foreign language and command of	
	Field of training         MOTHER TONGUE AND FOREIGN LANGUAGES         Mother tongue       Croatian         Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)       English (4)	foreign language on a scale from 2	
foreign language on a scale from 2	Field of training         MOTHER TONGUE AND FOREIGN LANGUAGES         Mother tongue       Croatian         Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)       English (4)         Foreign language and command of foreign language and command of foreign language on a scale from 2       English (4)	(sufficient) to 5 (excellent)	
foreign language on a scale from 2 (sufficient) to 5 (excellent)	Field of training       MOTHER TONGUE AND FOREIGN LANGUAGES         Mother tongue       Croatian         Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)       English (4)         Foreign language on a scale from 2 (sufficient) to 5 (excellent)       English (4)	Foreign language and command of	
foreign language on a scale from 2 (sufficient) to 5 (excellent) Foreign language and command of	Heid of training         MOTHER TONGUE AND FOREIGN LANGUAGES         Mother tongue       Croatian         Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)       English (4)         Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)       English (4)         Foreign language on a scale from 2 (sufficient) to 5 (excellent)       Foreign language on a scale from 2 (sufficient) to 5 (excellent)         Foreign language and command of foreign language and command foreign language and command foreign language and command foreign language and command foreign language and comman	foreign language on a scale from 2	
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foreign language on a scale from 2 (sufficient) to 5 (excellent) Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	Heid of training       Keylet         MOTHER TONGUE AND FOREIGN LANGUAGES       Croatian         Mother tongue       Croatian         Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)       English (4)         Foreign language on a scale from 2 (sufficient) to 5 (excellent)       English (4)         Foreign language on a scale from 2 (sufficient) to 5 (excellent)       Foreign language and command of foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)         Foreign language on a scale from 2 (sufficient) to 5 (excellent)       English (4)	COMPETENCES FOR THE COURS	SE
foreign language on a scale from 2 (sufficient) to 5 (excellent) Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent) COMPETENCES FOR THE COURSE	Field of training         MOTHER TONGUE AND FOREIGN LANGUAGES         Mother tongue       Croatian         Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)       English (4)         Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)       English (4)         Foreign language on a scale from 2 (sufficient) to 5 (excellent)       English (4)         Foreign language on a scale from 2 (sufficient) to 5 (excellent)       English (4)         Foreign language on a scale from 2 (sufficient) to 5 (excellent)       English (4)         COMPETENCES FOR THE COURSE       English (4)	Earlier experience as course	
foreign language on a scale from 2 (sufficient) to 5 (excellent) Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent) COMPETENCES FOR THE COURSE Earlier experience as course teacher of similar courses (name	Held of training         MOTHER TONGUE AND FOREIGN LANGUAGES         Mother tongue       Croatian         Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)       English (4)         Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)       English (4)         Foreign language on a scale from 2 (sufficient) to 5 (excellent)       English (4)         Foreign language on a scale from 2 (sufficient) to 5 (excellent)       Command of foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)         COMPETENCES FOR THE COURSE       Earlier experience as course teacher of similar courses (name)		
foreign language on a scale from 2 (sufficient) to 5 (excellent) Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent) COMPETENCES FOR THE COURSE Earlier experience as course teacher of similar courses (name	Held of training         MOTHER TONGUE AND FOREIGN LANGUAGES         Mother tongue       Croatian         Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)       English (4)         Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)       English (4)         Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)       Foreign language and command of foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)         Foreign language on a scale from 2 (sufficient) to 5 (excellent)       COMPETENCES FOR THE COURSE         Earlier experience as course teacher of similar courses (name       Image of the second	title of course, study programme	Lecturer of various courses since 2001
foreign language on a scale from 2 (sufficient) to 5 (excellent)         Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)         COMPETENCES FOR THE COURSE         Earlier experience as course teacher of similar courses (name title of course, study programme         Lecturer of various courses since 2001	Held of training         MOTHER TONGUE AND FOREIGN LANGUAGES         Mother tongue       Croatian         Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)       English (4)         Foreign language and command of foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)       English (4)         Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)       Earlier scale from 2 (sufficient) to 5 (excellent)         COMPETENCES FOR THE COURSE       Earlier experience as course teacher of similar courses (name title of course, study programme       Lecturer of various courses since 2001	where it is/was offered, and level	
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foreign language on a scale from 2 (sufficient) to 5 (excellent)         Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)         COMPETENCES FOR THE COURSE         Earlier experience as course teacher of similar courses (name title of course, study programme where it is/was offered, and level of study programme)	Held of training         MOTHER TONGUE AND FOREIGN LANGUAGES         Mother tongue       Croatian         Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)       English (4)         Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)       English (4)         Foreign language on a scale from 2 (sufficient) to 5 (excellent)       English (4)         Foreign language on a scale from 2 (sufficient) to 5 (excellent)       English (4)         Foreign language on a scale from 2 (sufficient) to 5 (excellent)       English (4)         COMPETENCES FOR THE COURSE       Earlier experience as course teacher of similar courses (name title of course, study programme where it is/was offered, and level of study programme)       Lecturer of various courses since 2001	Authorship of university/faculty	
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foreign language on a scale from 2 (sufficient) to 5 (excellent)         Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)         COMPETENCES FOR THE COURSE         Earlier experience as course teacher of similar courses (name title of course, study programme where it is/was offered, and level of study programme)         Authorship of university/faculty textbooks in the field of the course	Held of training         MOTHER TONGUE AND FOREIGN LANGUAGES         Mother tongue       Croatian         Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)       English (4)         Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)       English (4)         Foreign language on a scale from 2 (sufficient) to 5 (excellent)       Foreign language on a scale from 2 (sufficient) to 5 (excellent)         Foreign language on a scale from 2 (sufficient) to 5 (excellent)       English (4)         COMPETENCES FOR THE COURSE       Earlier experience as course teacher of similar courses (name title of course, study programme where it is/was offered, and level of study programme)       Lecturer of various courses since 2001         Authorship of university/faculty textbooks in the field of the course       Earlier experience as course	Professional, scholarly and artistic	
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Mirošević, Ivančica. Algoritam k-sredina. // KoG : znanstveno- stručni časopis Hrvatskog društva za konstruktivnu geometriju i kompjutorsku grafiku. 20 (2017), 20; 91-98 (članak, stručni). Mirošević, Ivančica; Koceić-Bilan, Nikola; Jurko, Josipa. Različiti nastavno-metodički pristupi čunjosječnicama. // Math.e : hrvatski matematički elektronski časopis. 27 (2015) ; 1-10 (članak, stručni).
EVALUATION

First and last name and title of teacher	Jadranka Marasović, Ph.D., Full Professor
The course he/she teaches in the	Madalling and Circulation
proposed study programme	Modelling and Simulation
GENERAL INFORMATION ON COL	JRSE TEACHER
Address	Split, Zagrebačka 21
Telephone number	385 021 305 830 (institution)
E-mail address	jmar@fesb.hr
Personal web page	
Year of birth	1955.
Scientist ID	080633
Research or art rank, and date of	Senior Research Scientist, 09, July 2007
last rank appointment	
Research-and-teaching, art-and-	
teaching or teaching rank, and	Full professor, 01. March 2009.
date of last rank appointment	
Area and field of election into	Technical science, field of electrical engineering
research or art rank	
INFORMATION ON CURRENT EM	
Institution where employed	Faculty of Electrical Engineering, Machine Engineering and Naval Architecture, University of Split
Date of employment	04. May 1978.
Name of position (professor,	
researcher, associate teacher,	Professor
etc.)	
Field of research	Science and Education
Function	/
INFORMATION ON EDUCATION -	Highest degree earned
Degree	Doctor of science
Institution	Faculty of Electrical Engineering, Machine Engineering and Naval Architecture, University of Split
Place	Split
Date	11. July 1997.
INFORMATION ON ADDITIONAL T	RAINING
Year	1
Place	1
Institution	/
Field of training	/
MOTHER TONGUE AND FOREIGN	LANGUAGES
Mother tongue	Croatian
Foreign language and command	
of foreign language on a scale	English (excellent -5)
from 2 (sufficient) to 5 (excellent)	
Foreign language and command	Italian (aufficient 2)
from 2 (sufficient) to 5 (excellent)	Italian (suncient-2)
Foreign language and command	
of foreign language on a scale	
from 2 (sufficient) to 5 (excellent)	
COMPETENCES FOR THE COURS	SE
	Undergraduate studies:
	Measurements and Process Control.
Earlier experience as course	Industrial Process Control
teacher of similar courses (name	Graduate studies:
where it is was offered, and lovel	
of study programme)	Automatic Control,
	System Identification,

	Process Control Laboratory Exercises Optimization Methods, Operations Research Automation <b>Postgraduate study:</b> Optimization Techniques for Environmental Studies (Wessex Institute of Tecnology, UK i FESB) Game theory and optimization methods (FESB) Complex systems modelling and simulation (FESB)
Authorship of university/faculty textbooks in the field of the course	<ul> <li>(autor) Kvantitativno i kvalitativno modeliranje i simuliranje (Quantitative and Qualitative Modelling and Simulation) (ISBN 953-6114-67-4),</li> <li>(koautor) On-line (web) udžbenik, Informatički projekt MZT-a, <u>http://laris.fesb.hr/digitalno_vodjenje</u> (Digital Control)</li> <li>(autor) Predavanja iz kolegija Metode optimizacije (Lessons for Optimizaion Methods) (FESB, e- learning).</li> <li>(autor) Predavanja iz kolegija Modeliranje i simuliranje sustava (Lessons for Modelling and Simulations) (FESB, e-learning).</li> </ul>
Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)	<ul> <li>Marasović, Tea; Papić, Vladan; Marasović, Jadranka. Motion-based Gesture Recognition Algorithms for Robot Manipulation. // International Journal of Advanced Robotic Systems. 12 (2015), 51; 1-13, doi: 10.5772/60077.</li> <li>Marasović, Jadranka; Marasović, Tea; Đapić, Marija. Fair Division Methods Approach as the Option of Learning Process Modeling. // Proceedings of 18th IEEE International Symposium on Computers and Communications (ISCC). 2013; 735-739.</li> <li>Mance, Davor; Marasović, Jadranka. EMC in Electronic System Developed to Support Measurements in Space Environment. // Proceedings of 20th International Conference on Software, Telecommunications and Computer Networks (SoftCOM). 2012; 1-5.</li> </ul>
Professional and scholarly articles published in the last five years in subjects of teaching methodology and teaching quality (5 works at most)	/
Professional, science and artistic projects in the field of the course carried out in the last five years (5 at most)	<ul> <li>Associated member in scientific projects:</li> <li>Računalna inteligencija za prepoznavanje i potporu ljudskih aktivnosti (RIPrePAkt),</li> <li>GRS Front End Electronics Characterization for LISA,</li> <li>Agentski orijentirani inteligentni sustavi za nadzor i zaštitu okoliša (Agents Oriented Intelligent Systems for Environment Control and Protection),</li> </ul>

	<ul> <li>Inteligentni agenti u modeliranju i vođenju kompleksnih sustava (Intelligent Agents used for Complex Systems Modelling and Control),</li> <li>Vođenje složenih sustava inteligentnim metodama (Intelligent Methods for Complex Systems Control).</li> </ul>
The name of the programme and the volume in which the main teacher passed exams in/acquired the methodological-psychological- didactic-pedagogical group of competences?-pedagoške kompetencije?	/
PRIZES AND AWARDS, STUDENT	EVALUATION
Prizes and awards for teaching and scholarly/artistic work	/
Results of student evaluation taken in the last five years for the course that is comparable to the course described in the form (evaluation organizer, average grade, note on grading scale and course evaluated)	

First and last name and title of teacher	Ivan Marinović, Ph.D., Full Professor
The course he/she teaches in the	Electronic Circuits Design
proposed study programme	High-Frequency Electronics
GENERAL INFORMATION ON COL	IRSE TEACHER
Address	Butor dolac 13, 21/05 Milna, o. Brač
Tolophono numbor	009 1925011
	imarin@fosh.hr
Porconal web page	Intaline less.in
Vear of birth	1066
Scientist ID	200263
Research or art rank, and date of	200203
last rank appointment	Scientific Advisor, 20.06.2016.
Research-and-teaching art-and-	
teaching or teaching rank and	Full Professor 15.07.2016
date of last rank appointment	
Area and field of election into	
research or art rank	Technical Sciences, Electrical Engineering
INFORMATION ON CURRENT EME	
	Eaculty of Electrical Engineering, Mechanical Engineering and
Institution where employed	Naval Architecture – Split
Date of employment	21 02 1001
Name of position (professor	21.02.1991.
researcher, associate teacher	Professor
ote )	FIDIESSO
Field of research	Electronics Padiocommunications
	Head of Cathodra for Padiocommunication Circuite and
Function	Systems
	Uighaat dagraa aarnad
	ו וועוובט עבעובב במווובע
Degree	
Degree	PhD Exculty of Electrical Engineering, Mechanical Engineering and
Degree	PhD Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture – Split
Degree Institution	PhD Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture – Split
Degree Institution Place Date	PhD Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture – Split Split
Degree Institution Place Date	PhD Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture – Split Split 12.05.2005.
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Degree Institution Place Date INFORMATION ON ADDITIONAL T Year	PhD Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture – Split Split 12.05.2005. RAINING
Degree Institution Place Date INFORMATION ON ADDITIONAL T Year Place	PhD Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture – Split Split 12.05.2005. RAINING
Degree Institution Place Date INFORMATION ON ADDITIONAL T Year Place Institution Eield of training	PhD Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture – Split Split 12.05.2005. RAINING
Degree Institution Place Date INFORMATION ON ADDITIONAL T Year Place Institution Field of training	PhD Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture – Split Split 12.05.2005. RAINING
Degree Institution Place Date INFORMATION ON ADDITIONAL T Year Place Institution Field of training MOTHER TONGUE AND FOREIGN	PhD Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture – Split Split 12.05.2005. RAINING
Degree Institution Place Date INFORMATION ON ADDITIONAL T Year Place Institution Field of training MOTHER TONGUE AND FOREIGN Mother tongue	PhD Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture – Split Split 12.05.2005. RAINING LANGUAGES Croatian
Degree Institution Place Date INFORMATION ON ADDITIONAL T Year Place Institution Field of training MOTHER TONGUE AND FOREIGN Mother tongue Foreign language and command of fareign language on a scale from 2	PhD Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture – Split Split 12.05.2005. RAINING LANGUAGES Croatian English (4)
Degree Institution Place Date INFORMATION ON ADDITIONAL T Year Place Institution Field of training MOTHER TONGUE AND FOREIGN Mother tongue Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	PhD Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture – Split Split 12.05.2005. RAINING LANGUAGES Croatian English (4)
Degree Institution Place Date INFORMATION ON ADDITIONAL T Year Place Institution Field of training MOTHER TONGUE AND FOREIGN Mother tongue Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent) Excertion language and command of	PhD Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture – Split Split 12.05.2005. RAINING LANGUAGES Croatian English (4)
Degree Institution Place Date INFORMATION ON ADDITIONAL T Year Place Institution Field of training MOTHER TONGUE AND FOREIGN Mother tongue Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent) Foreign language and command of foreign language on a scale from 2	PhD Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture – Split Split 12.05.2005. RAINING LANGUAGES Croatian English (4)
Degree         Institution         Place         Date         INFORMATION ON ADDITIONAL T         Year         Place         Institution         Field of training         MOTHER TONGUE AND FOREIGN         Mother tongue         Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)         Foreign language on a scale from 2 (sufficient) to 5 (excellent)	PhD Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture – Split Split 12.05.2005. RAINING LANGUAGES Croatian English (4) Italian (4)
Degree Institution Place Date INFORMATION ON ADDITIONAL T Year Place Institution Field of training MOTHER TONGUE AND FOREIGN Mother tongue Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent) Foreign language on a scale from 2 (sufficient) to 5 (excellent) Foreign language on a scale from 2 (sufficient) to 5 (excellent)	PhD Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture – Split Split 12.05.2005. RAINING LANGUAGES Croatian English (4) Italian (4)
Degree Institution Place Date INFORMATION ON ADDITIONAL T Year Place Institution Field of training MOTHER TONGUE AND FOREIGN Mother tongue Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent) Foreign language on a scale from 2 (sufficient) to 5 (excellent) Foreign language on a scale from 2 (sufficient) to 5 (excellent) Foreign language on a scale from 2	PhD Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture – Split Split 12.05.2005. RAINING LANGUAGES Croatian English (4) Italian (4)
Degree         Institution         Place         Date         INFORMATION ON ADDITIONAL T         Year         Place         Institution         Field of training         MOTHER TONGUE AND FOREIGN         Mother tongue         Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)         Foreign language on a scale from 2 (sufficient) to 5 (excellent)         Foreign language on a scale from 2 (sufficient) to 5 (excellent)	PhD Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture – Split Split 12.05.2005. RAINING LANGUAGES Croatian English (4) Italian (4)
Degree         Institution         Place         Date         INFORMATION ON ADDITIONAL T         Year         Place         Institution         Field of training         MOTHER TONGUE AND FOREIGN         Mother tongue         Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)         Foreign language on a scale from 2 (sufficient) to 5 (excellent)         Foreign language on a scale from 2 (sufficient) to 5 (excellent)         Foreign language on a scale from 2 (sufficient) to 5 (excellent)         Foreign language on a scale from 2 (sufficient) to 5 (excellent)         Foreign language on a scale from 2 (sufficient) to 5 (excellent)	PhD Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture – Split Split 12.05.2005. RAINING LANGUAGES Croatian English (4) Italian (4)
Institution         Place         Date         INFORMATION ON ADDITIONAL T         Year         Place         Institution         Field of training         MOTHER TONGUE AND FOREIGN         Mother tongue         Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)         Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)         Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)         Foreign language on a scale from 2 (sufficient) to 5 (excellent)         Foreign language on a scale from 2 (sufficient) to 5 (excellent)         Foreign language on a scale from 2 (sufficient) to 5 (excellent)         Foreign language on a scale from 2 (sufficient) to 5 (excellent)         COMPETENCES FOR THE COURS         Earlier experience as course	PhD Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture – Split Split 12.05.2005. RAINING LANGUAGES Croatian English (4) Italian (4) Electronic Circuits, Graduate study programme
Degree         Institution         Place         Date         INFORMATION ON ADDITIONAL T         Year         Place         Institution         Field of training         MOTHER TONGUE AND FOREIGN         Mother tongue         Foreign language and command of         foreign language on a scale from 2         (sufficient) to 5 (excellent)         Foreign language on a scale from 2         (sufficient) to 5 (excellent)         Foreign language on a scale from 2         (sufficient) to 5 (excellent)         Foreign language on a scale from 2         (sufficient) to 5 (excellent)         Foreign language on a scale from 2         (sufficient) to 5 (excellent)         Foreign language on a scale from 2         (sufficient) to 5 (excellent)         Foreign language on a scale from 2         (sufficient) to 5 (excellent)         COMPETENCES FOR THE COURS         Earlier experience as course         teacher of similar courses (name)	PhD Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture – Split Split 12.05.2005. RAINING LANGUAGES Croatian English (4) Italian (4) Electronic Circuits, Graduate study programme Electronic Circuits, Graduate study programme Electronic Circuits, Graduate study programme
Degree         Institution         Place         Date         INFORMATION ON ADDITIONAL T         Year         Place         Institution         Field of training         MOTHER TONGUE AND FOREIGN         Mother tongue         Foreign language and command of         foreign language on a scale from 2         (sufficient) to 5 (excellent)         Foreign language on a scale from 2         (sufficient) to 5 (excellent)         Foreign language on a scale from 2         (sufficient) to 5 (excellent)         Foreign language on a scale from 2         (sufficient) to 5 (excellent)         Foreign language on a scale from 2         (sufficient) to 5 (excellent)         Foreign language on a scale from 2         (sufficient) to 5 (excellent)         Foreign language on a scale from 2         (sufficient) to 5 (excellent)         COMPETENCES FOR THE COURS         Earlier experience as course         teacher of similar courses (name         title of course	PhD Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture – Split Split 12.05.2005. RAINING LANGUAGES Croatian English (4) Italian (4) Electronic Circuits, Graduate study programme Electronic Circuits and Measurements, Graduate study programme
Degree         Institution         Place         Date         INFORMATION ON ADDITIONAL T         Year         Place         Institution         Field of training         MOTHER TONGUE AND FOREIGN         Mother tongue         Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)         Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)         Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)         Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)         Foreign language on a scale from 2 (sufficient) to 5 (excellent)         Eoreign language on a scale from 2 (sufficient) to 5 (excellent)         COMPETENCES FOR THE COURS         Earlier experience as course         teacher of similar courses (name title of course, study programme where it is/was offered, and level	PhD Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture – Split Split 12.05.2005. RAINING LANGUAGES Croatian English (4) Italian (4) Electronic Circuits, Graduate study programme Electronic Circuits and Measurements, Graduate study programme Microwave Electronics, Graduate study programme
Degree         Institution         Place         Date         INFORMATION ON ADDITIONAL T         Year         Place         Institution         Field of training         MOTHER TONGUE AND FOREIGN         Mother tongue         Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)         Foreign language on a scale from 2 (sufficient) to 5 (excellent)         Foreign language on a scale from 2 (sufficient) to 5 (excellent)         Foreign language on a scale from 2 (sufficient) to 5 (excellent)         Foreign language on a scale from 2 (sufficient) to 5 (excellent)         Earlier experience as course teacher of similar courses (name title of course, study programme where it is/was offered, and level of study programme)	PhD Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture – Split Split 12.05.2005. RAINING LANGUAGES Croatian English (4) Italian (4) SE Electronic Circuits, Graduate study programme Electronic Circuits and Measurements, Graduate study programme Microwave Electronics, Graduate study programme Radiocommunications, Graduate study programme Radiocommunications, Graduate study programme Radiocommunications, Graduate study programme
Degree         Institution         Place         Date         INFORMATION ON ADDITIONAL T         Year         Place         Institution         Field of training         MOTHER TONGUE AND FOREIGN         Mother tongue         Foreign language and command of         foreign language on a scale from 2         (sufficient) to 5 (excellent)         Foreign language on a scale from 2         (sufficient) to 5 (excellent)         Foreign language on a scale from 2         (sufficient) to 5 (excellent)         Foreign language on a scale from 2         (sufficient) to 5 (excellent)         Foreign language on a scale from 2         (sufficient) to 5 (excellent)         COMPETENCES FOR THE COURS         Earlier experience as course         teacher of similar courses (name         title of course, study programme         where it is/was offered, and level         of study programme)         Authorship of university/faculty	PhD Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture – Split Split 12.05.2005. RAINING LANGUAGES Croatian English (4) Italian (4) E Electronic Circuits, Graduate study programme Electronic Circuits and Measurements, Graduate study programme Microwave Electronics, Graduate study programme Radiocommunications, Graduate study programme Marinović, Ivan; Čoko, Duie, Electronički sklopovi-Unute za

Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)	
Professional and scholarly articles published in the last five years in subjects of teaching methodology and teaching quality (5 works at most)	
Professional, science and artistic projects in the field of the course carried out in the last five years (5 at most)	
The name of the programme and the volume in which the main teacher passed exams in/acquired the methodological-psychological- didactic-pedagogical group of competences	
PRIZES AND AWARDS, STUDENT	EVALUATION
and scholarly/artistic work	
Results of student evaluation taken in the last five years for the course that is comparable to the course described in the form (evaluation organizer, average grade, note on grading scale and course evaluated)	4.8

First and last name and title of teacher	Tonći Modrić, Ph.D., Assistant Professor
The course he/she teaches in the	Electrical Power Switchgears
proposed study programme	Power System and Environment
GENERAL INFORMATION ON COL	RSE TEACHER
Address	Tijardovićeva 14. 21000 Split. Croatia
Telephone number	+385 21 305-630
F-mail address	tmodric@fesb.hr
Personal web page	-
Year of birth	1982.
Scientist ID	325646
Research or art rank, and date of	
last rank appointment	Research associate, 20.11.2014.
Research-and-teaching, art-and-	
teaching or teaching rank, and date	Assistant Professor, 17.12.2014.
of last rank appointment	
Area and field of election into	Technical Sciences, Electrical Engineering
research or art rank	
INFORMATION ON CURRENT EMP	LOYMENT
Institution where employed	University of Split Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture (FESB)
Date of employment	1.12.2010.
Name of position (professor,	Assistant Professor
researcher, associate teacher, etc.)	
Field of research	Electric Power Engineering
Function	-
INFORMATION ON EDUCATION - I	Highest degree earned
Degree	Ph. D.
Institution	FESB
Place	Split
Date	5.5.2014.
INFORMATION ON ADDITIONAL TR	RAINING
Year	-
Place	-
Institution	-
Field of training	-
MOTHER TONGUE AND FOREIGN	LANGUAGES
Mother tongue	Croatian
Foreign language and command of foreign language on a scale from 2	English, 4
(sufficient) to 5 (excellent)	-
COMPETENCES FOR THE COURS	E
Earlier experience as course	
teacher of similar courses (name	
title of course, study programme	-
where it is/was offered, and level of	
study programme)	
Authorship of university/faculty textbooks in the field of the course	-
Professional, scholarly and artistic	1. Lovrić, D.; Vujević, S.; Modrić, T.: "Comparison of
articles published in the last five	different metal oxide surge arrester models", Proceedings
years in the field of the course (5	or the international Conference on Applied
works at most)	2011, pp. (O1-2) 1-4.

	<ol> <li>Vujević, S.; Balaž, Z.; Modrić, T.; Sarajčev, P.: "Hybrid Model for Analysis of Ground Fault Current Distribution", International Review of Electrical Engineering, Vol. 7 (2), 2012, pp. 4035–4045.</li> <li>Modrić, T.; Vujević, S.; Lovrić, D.: "Napredni algoritmi za analizu elektromagnetskih polja elektroenergetskih vodova i postrojenja", 11. savjetovanje HRO CIGRE / Filipović-Grčić, B. (ur.) - Zagreb: Hrvatski ogranak CIGRE, 2013. pp. (C4–18) 1–10.</li> <li>Modrić, T.; Vujević, S.; Majić, T.: "Geometrical Approximation of the Overhead Power Line Conductors", International Review on Modelling and Simulations, Vol. 7(1), 2014, pp. 76–82.</li> <li>Vujević, S.; Modrić, T.; Vukić, B.: "Internal Impedance of Two-Layer Cylindrical Conductors", International Review of Electrical Engineering, Vol. 9(1), 2014, pp. 235–243.</li> </ol>
Professional and scholarly articles published in the last five years in subjects of teaching methodology and teaching quality (5 works at most)	-
Professional, science and artistic projects in the field of the course carried out in the last five years (5 at most)	<ol> <li>Vujević, S.; Lucić, R.; Jurić-Grgić, I.; Lovrić, D.; Modrić, T.; Balaž, Z.: "Izrada pravila i mjera sigurnosti za osiguranje mjesta rada na elektroenergetskim vodovima", 2013.</li> <li>Vujević, S.; Lovrić, D.; Modrić, T.: "Mjerenje i analiza razine neionizirajućeg elektromagnetskog polja u okolišu TS 10/0,4 kV Brda 3", 2013.</li> </ol>
The name of the programme and the volume in which the main teacher passed exams in/acquired the methodological-psychological- didactic-pedagogical group of competences?	-
PRIZES AND AWARDS, STUDENT	EVALUATION
Prizes and awards for teaching and scholarly/artistic work	-
Results of student evaluation taken in the last five years for the course that is comparable to the course described in the form (evaluation organizer, average grade, note on grading scale and course evaluated)	4,75/5

First and last name and title of teacher	Josip Musić, Ph.D., Assistant Professor
The course he/she teaches in the	Automation, Biomechanics practicum, Sensors and
proposed study programme	transducers
GENERAL INFORMATION ON COL	IRSE TEACHER
Address	Ruđera Boškovića 32. Split
Telephone number	+ 385 (0)21 305 829
E-mail address	imusic@fesb.hr
Personal web page	http://marjan.fesb.hr/~jmusic
Year of birth	1980
Scientist ID	272932
Research or art rank, and date of	Senior research associate (February 2013)
last rank appointment	
Research-and-teaching, art-and-	
teaching or teaching rank, and	Assistant professor (July 2014)
date of last rank appointment	
Area and held of election into	Technical sciences, Electrical engineering
	2UYMENT
Institution where employed	Faculty of electrical engineering, mechanical engineering and
Date of employment	Soptombor 2014
Name of position (professor	
researcher associate teacher	Assistant professor
etc.)	
Field of research	Robotics and automatization
Function	1
INFORMATION ON EDUCATION -	Highest degree earned
Degree	PhD
Institution	Faculty of electrical engineering, mechanical engineering and
	naval architecture, University of Split
Place	Split
Date	28.04.2010.
INFORMATION ON ADDITIONAL T	RAINING
Year	2012
Place	Glasgow, Scotland, UK
Institution	School of Computing, University of Glasgow
Field of training	human-computer interaction (HCI), signal processing
Veer	2000
Place	2000 Glasgow Scotland LIK
Institution	Department of Computing University of Clasgow
Field of training	buman-computer interaction (HCI) signal processing
Year	2005.
Place	Ljubljana, Slovenia
Institution	Faculty of electrical engineering, University of Ljubljana
Field of training	robotics, biomechanics
MOTHER TONGUE AND FOREIGN	LANGUAGES
Mother tongue	Croatian
Foreign language and command of	
foreign language on a scale from 2	English (5)
(sufficient) to 5 (excellent)	
Foreign language and command of	
toreign language on a scale from 2	Italian (2)
(Sufficient) to 5 (excellent)	

COMPETENCES FOR THE COURS	SE
Earlier experience as course teacher of similar courses (name title of course, study programme where it is/was offered, and level of study programme)	Automation (412/512), Automatic control 2 (910,11), Digital electronics (110), Digital control (210), Sensors and transducers (512), Biomechanics Practicum (412/512), Programing mobile robots and drones (221/222/242/250), Computer methods in biomechanics (111), Computers and computer methods in biomechanics (310/330), Telemedicine and biocybernetics (210/220/242)m Introduction to system theory (330)
Authorship of university/faculty textbooks in the field of the course	M. Bonković, J. Musić, I. Stančić, Microcontrollers and embedded network systems based on Arduino development environment, faculty script, 2014
Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)	<ol> <li>Musić, Josip; Bonković, Mirjana; Cecić, Mojmil: "Comparison of uncalibrated model-free visual servoing methods for small amplitude movement: a simulation study", International Journal of Advanced Robotic Systems, 2014 (DOI: dx.doi.org/10.5772/58822 )</li> <li>Stančić, Ivo; Musić, Josip; Cecić, Mojmil: "A Novel Low- Cost Adaptive Scanner Concept for Mobile Robots", Ingenieria e Investigacion, 34 (2014), 3; 37-43</li> <li>Stančić, Ivo; Musić, Josip; Zanchi, Vlasta: "Improved structured light 3D scanner with application to anthropometric parameter estimation", Measurement, 46 (2013), 1; 716-726</li> <li>Musić, Josip; Cecić, Mojmil; Zanchi, Vlasta: "Real-time body orientation estimation based on two-layer stochastic filter architecture", Automatika : časopis za automatiku, mjerenje, elektroniku, računarstvo i komunikacije, 51 (2010), 3; 264-274</li> <li>Musić, Josip; Murray-Smith, Roderick: "Virtual Hooping: teaching a phone about hula-hooping for Fitness, Fun and Rehabilitation", Proceedings of Mobile Human Computer Interaction (MobileHCI) 2010. 309-312</li> </ol>
Professional and scholarly articles published in the last five years in subjects of teaching methodology and teaching quality (5 works at most)	/
Professional, science and artistic projects in the field of the course carried out in the last five years (5 at most)	<ol> <li>Compressive sensing and super-resolution in surveillance systems based on optical sensors and UAVs, 2015-2017, Bilateral Croatia-Montenegro cooperation, project lead</li> <li>Supervised and unsupervised learning from imbalanced datasets for assistance in movement of persons with low vision, 2014-2015, Bilateral Croatia-Slovenia cooperation, project lead</li> <li>Prototyping a module for automatization of industrial floor scrubbers, 2014-2016, Split-Dalmatia county and Odabir d.o.o., project lead</li> <li>Computer intelligence for classification and support of human activities, 2014 - , Faculty/University project, researcher</li> </ol>

	5. Biomechanics of human motion, control and rehabilitation, 2007-2014, Ministry of science, education and sports, researcher
The name of the programme and the volume in which the main teacher passed exams in/acquired the methodological-psychological- didactic-pedagogical group of competences?-pedagoške kompetencije?	/
PRIZES AND AWARDS, STUDENT	EVALUATION
Prizes and awards for teaching and scholarly/artistic work	1
Results of student evaluation taken in the last five years for the course that is comparable to the course described in the form (evaluation organizer, average grade, note on grading scale and course evaluated)	/
teacher	Julije Ožegović, Ph.D., Full Professor
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The course he/she teaches in the proposed study programme	Digital Techniques, Computer Networks, Designing and Using Computer Networks, Computer and Data Security
Tolophono number	
	+305 21 305025
E-mail address	Julie.02egovic@lesb.m
Vear of birth	105 <i>1</i>
Scientist ID	91795
Research or art rank, and date of	51135
last rank appointment	Scientific Advisor, 2008-03-12
Research-and-teaching, art-and-	
teaching or teaching rank, and	Senior Full Professor. 2013-09-15
date of last rank appointment	
Area and field of election into	Taskning Colonges, Field Fleetrical engineering
research or art rank	rechnical Sciences, Field Electrical engineering
INFORMATION ON CURRENT EMP	PLOYMENT
Institution where employed	Faculty of Electrical Engineering, Mechanical Engineering and
	Naval Architecture
Date of employment	1979-10-01
Name of position (professor,	
researcher, associate teacher,	Professor
etc.)	
Field of research	Digital electronics, Computer networks, Automata theory
Function	Head of Chair of Digital Systems and Computer Network
INFORMATION ON EDUCATION -	Highest degree earned
Desire	
Degree	PhD
Institution	Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture
Institution Place	Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture Split
Institution Place Date	Find Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture Split 1998-02-27
Institution Place Date INFORMATION ON ADDITIONAL T	Find Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture Split 1998-02-27 RAINING
Institution Place Date INFORMATION ON ADDITIONAL T Year	Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture Split 1998-02-27 RAINING
Institution Place Date INFORMATION ON ADDITIONAL T Year Place	Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture Split 1998-02-27 RAINING
Institution Place Date INFORMATION ON ADDITIONAL T Year Place Institution	Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture Split 1998-02-27 RAINING
Institution Place Date INFORMATION ON ADDITIONAL T Year Place Institution Field of training	Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture Split 1998-02-27 RAINING
Institution Place Date INFORMATION ON ADDITIONAL T Year Place Institution Field of training MOTHER TONGUE AND FOREIGN	Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture Split 1998-02-27 RAINING
Institution Place Date INFORMATION ON ADDITIONAL T Year Place Institution Field of training MOTHER TONGUE AND FOREIGN Mother tongue	Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture Split 1998-02-27 RAINING LANGUAGES Croatian
Institution Place Date INFORMATION ON ADDITIONAL T Year Place Institution Field of training MOTHER TONGUE AND FOREIGN Mother tongue Foreign language and command of	Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture Split 1998-02-27 RAINING LANGUAGES Croatian
Institution Place Date INFORMATION ON ADDITIONAL T Year Place Institution Field of training MOTHER TONGUE AND FOREIGN Mother tongue Foreign language and command of foreign language on a scale from 2	Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture Split 1998-02-27 RAINING LANGUAGES Croatian English (5)
Institution Place Date INFORMATION ON ADDITIONAL T Year Place Institution Field of training MOTHER TONGUE AND FOREIGN Mother tongue Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture Split 1998-02-27 RAINING LANGUAGES Croatian English (5)
Institution Place Date INFORMATION ON ADDITIONAL T Year Place Institution Field of training MOTHER TONGUE AND FOREIGN Mother tongue Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent) Foreign language and command of	Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture Split 1998-02-27 RAINING LANGUAGES Croatian English (5)
Institution Place Date INFORMATION ON ADDITIONAL T Year Place Institution Field of training MOTHER TONGUE AND FOREIGN Mother tongue Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent) Foreign language on a scale from 2	Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture Split 1998-02-27 RAINING LANGUAGES Croatian English (5)
Institution Place Date INFORMATION ON ADDITIONAL T Year Place Institution Field of training MOTHER TONGUE AND FOREIGN Mother tongue Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent) Foreign language on a scale from 2 (sufficient) to 5 (excellent)	Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture Split 1998-02-27 RAINING LANGUAGES Croatian English (5)
Institution Place Date INFORMATION ON ADDITIONAL T Year Place Institution Field of training MOTHER TONGUE AND FOREIGN Mother tongue Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent) Foreign language on a scale from 2 (sufficient) to 5 (excellent) Foreign language on a scale from 2 (sufficient) to 5 (excellent)	Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture Split 1998-02-27 RAINING LANGUAGES Croatian English (5)
Degree         Institution         Place         Date         INFORMATION ON ADDITIONAL T         Year         Place         Institution         Field of training         MOTHER TONGUE AND FOREIGN         Mother tongue         Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)         Foreign language on a scale from 2 (sufficient) to 5 (excellent)         COMPETENCES FOR THE COURS	Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture Split 1998-02-27 RAINING LANGUAGES Croatian English (5) E Digital Electronics, Undergraduate study of Electrotechnics, 2006/2007 - today
Degree         Institution         Place         Date         INFORMATION ON ADDITIONAL T         Year         Place         Institution         Field of training         MOTHER TONGUE AND FOREIGN         Mother tongue         Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)         Foreign language on a scale from 2 (sufficient) to 5 (excellent)         COMPETENCES FOR THE COURS         Earlier experience as course teacher of similar courses (name	PhD         Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture         Split         1998-02-27         RAINING         LANGUAGES         Croatian         English (5)         Bigital Electronics, Undergraduate study of Electrotechnics, 2006/2007 - today         Discrete systems and structures, Undergraduate study of Computing 2006/2007 - today
Degree         Institution         Place         Date         INFORMATION ON ADDITIONAL T         Year         Place         Institution         Field of training         MOTHER TONGUE AND FOREIGN         Mother tongue         Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)         Foreign language on a scale from 2 (sufficient) to 5 (excellent)         COMPETENCES FOR THE COURS         Earlier experience as course teacher of similar courses (name title of course, study programme where it is/was offered, and level	PhD         Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture         Split         1998-02-27         RAINING         LANGUAGES         Croatian         English (5)         Digital Electronics, Undergraduate study of Electrotechnics, 2006/2007 - today         Discrete systems and structures, Undergraduate study of Electrotechnics, 2006/2007 - today         Computer Networks, Undergraduate study of Electrotechnics, 2006/2007 - today
Degree         Institution         Place         Date         INFORMATION ON ADDITIONAL T         Year         Place         Institution         Field of training         MOTHER TONGUE AND FOREIGN         Mother tongue         Foreign language and command of         foreign language on a scale from 2         (sufficient) to 5 (excellent)         Foreign language on a scale from 2         (sufficient) to 5 (excellent)         COMPETENCES FOR THE COURS         Earlier experience as course         teacher of similar courses (name         title of course, study programme         where it is/was offered, and level         of study programme)	PhD         Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture         Split         1998-02-27         RAINING         LANGUAGES         Croatian         English (5)         Digital Electronics, Undergraduate study of Electrotechnics, 2006/2007 - today         Discrete systems and structures, Undergraduate study of Computing, 2006/2007 - today         Computer Networks, Undergraduate study of Electrotechnics, 2006/2007 - today

	Digital Electronics, Graduate study of Electrotechnics (pre- Bologna), 1998/1999 -2006/2007
	Discrete systems and structures, Graduate study of Computing (pre-Bologna), 19982000/2001 - 2006/2007
	Computer Networks, Graduate study of Electrotechnics (pre- Bologna), 1998/1999 -2007/2008
	Computer Networks, Graduate study of Computing (pre- Bologna), 1998/1999 -2007/2008
	Julije Ožegović, Digitalna i mikroprocesorska tehnika, ISBN
Authorphip of university/feaulty	953-6806-26-6, Split University, 2000, several editions
textbooks in the field of the course	structures, elearning fesh br, undated from 1908
	Julije Ožegović Computer Networks, elearning fesh hr
	updated from 1998
	Kedžo, Ivan; Ožegović, Julije; Kristić, Ante: Contention Overhead — Adaptive Binary Priority Countdown protocol, SoftCOM 2013, ISBN 978-953-290-043-9
Professional scholarly and artistic	Kristić, Ante; Ožegović, Julije; Kedžo, Ivan: Mathematical model of simplified Constrained Priority Countdown Freezing protocol, The 18th IEEE Symposium on Computers and Communications (ISCC'13), 2013, ISBN 978-1-4673-2711
articles published in the last five years in the field of the course (5 works at most)	Kristić, Ante; Ožegović, Julije; Kedžo, Ivan: Improved mathematical model of simplified Constrained Priority Countdown Freezing protocol, SoftCOM 2013, ISBN 978-953- 290-043-9
	Kristić, Ante; Ožegović, Julije; Kedžo, Ivan: Mathematical model of Constrained Priority Countdown Freezing Protocol, SoftCOM 2014, ISBN 978-9-5329-0052-1
	Ines Ramadza, Julije Ozegovic, Vesna Pekic: Class based tunnel exclusion router architecture, SoftCOM 2014, ISBN 978-9-5329-0052-1
Professional and scholarly articles	
published in the last five years in subjects of teaching methodology	
and teaching quality (5 works at	
most)	
Professional, science and artistic	1. Media access mechanism modelling for wireless local
carried out in the last five years (5	networks (MAMM), FESB Split, od 2014.
at most)	2. HOCAL - CERN CMIS, HOIT 2015.
The name of the programme and the volume in which the main	
teacher passed exams in/acquired	Me4CataLOgue – Teaching and administrative personnel
the methodological-psychological-	training
didactic-pedagogical group of	
PRIZES AND AWARDS STUDENT	ΕΛΑΓΠΑΤΙΟΝ
Prizes and awards for teaching	Coguther of awarded paper JSCC conference 2012
and scholarly/artistic work	
Results of student evaluation taken	
that is comparable to the course	
described in the form (evaluation	4
organizer, average grade, note on	
evaluated)	

First and last name and title of teacher	Goran Petrović, Ph.D., Associate Professor
The course he/she teaches in the proposed study programme	Introduction to computer applications Measurements in Power System Measurements of Process Quantities Instrumentation for Smart Grid
GENERAL INFORMATION ON COL	JRSE TEACHER
Address	Split. Ruđera Boškovića 32
Telephone number	+385 21 305 731
E-mail address	petrovic@fesb.hr
Personal web page	
Year of birth	1971
Scientist ID	248882
Research or art rank, and date of last rank appointment	Research scientist 19.12. 2012.
Research-and-teaching, art-and- teaching or teaching rank, and date of last rank appointment	Associate professor 19.12. 2012.
Area and field of election into research or art rank	Technical sciences, electrical engineering
INFORMATION ON CURRENT EMP	PLOYMENT
Institution where employed	FESB
Date of employment	30. 03. 1998.
Name of position (professor, researcher, associate teacher, etc.)	professor
Field of research	Electrical and process measurement, Signal processing
Function	Head of Department for power engineering
INFORMATION ON EDUCATION -	Highest degree earned
Degree	PhD
Institution	FESB
Place	Split
Date	24. 03. 2006.
INFORMATION ON ADDITIONAL T	RAINING
Year	
Place	
Institution	
Field of training	
MOTHER TONGUE AND FOREIGN	LANGUAGES
Mother tongue	Croatian
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	English; very good (4)
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	
COMPETENCES FOR THE COURS	SE CONTRACTOR CON
Earlier experience as course teacher of similar courses (name	1. Measurement and signal processing, Electrical engineering, graduate

title of course, study programme where it is/was offered, and level of study programme)	<ol> <li>Process measurement, Electrical engineering, graduate</li> <li>Instrumentation in electrical engineering, Electrical engineering, undergraduate</li> </ol>
Authorship of university/faculty	
	1. Bosnić, Juraj Alojzije; Petrović, Goran; Malarić, Roman. Estimation of the wall thermal properties through comparison of experimental and simulated heat flux // 21ST IMEKO TC-4 measurement. Budapest, 2016.
	2. Mostarac, Petar; Malarić, Roman; Petrović, Goran. Measurement of frequency spectrum with interpolated adaptive chirp-z transformation // XXI IMEKO world congres. Prag,: Czech Technical University in Prague, 2015. 2008- 2011.
Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)	3. Petrović, Goran; Malarić, Roman; Ivana, Kardum. Matlab based flickermeter // 20th IMEKO TC4 International Symposium and 18th International Workshop on ADC Modelling and Testing. Benevento: University of Sannio, 2014. 31-34.
	4. Lorincz, Josip; Matijević, Tončica; Petrović, Goran. On interdependence among transmit and consumed power of macro base station technologies. // Computer communications. 50 (2014) ; 10-28
	5. Petrović, Goran; Kilić, Tomislav; Garma, Tonko. Measurement and Estimation of the Extremely Low Frequency Magnetic Field of the Overhead Power Lines. // Elektronika ir elektrotechnika. 19 (2013) , 7; 33-36.
Professional and scholarly articles published in the last five years in subjects of teaching methodology and teaching quality (5 works at most)	
Professional, science and artistic projects in the field of the course carried out in the last five years (5 at most)	<ol> <li>Smart grid metrology infrastructure, HRZZ Research Projects 2015-</li> <li>Extracting electric energy from human body for supplying autonomous biomedical devices and new PVDF transducer optimization, Bilateral Croatian Italian scientific project 2010- 2013.</li> </ol>
The name of the programme and the volume in which the main teacher passed exams in/acquired the methodological-psychological- didactic-pedagogical group of competences?-pedagoške kompetencije?	
PRIZES AND AWARDS, STUDENT	EVALUATION
Prizes and awards for teaching and scholarly/artistic work	
Results of student evaluation taken in the last five years for the course	
that is comparable to the course	
organizer, average grade, note on	

grading scale and course	
evaluated)	

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First and last name and title of	Mladen Russo, Ph.D., Assistant Professor
The course he/she teaches in the	
proposed study programme	Multimedia
GENERAL INFORMATION ON COL	JRSE TEACHER
Address	Žnjanska 4, Split
Telephone number	091/2305-844
E-mail address	mrusso@fesb.hr
Personal web page	
Year of birth	1977.
Scientist ID	248902
Research or art rank, and date of last rank appointment	Senior scientific associate, 24.10.2013.
Research-and-teaching, art-and- teaching or teaching rank, and date of last rank appointment	Assistant professor, 01.01.2013.
Area and field of election into research or art rank	Technical sciences, electrical engineering
INFORMATION ON CURRENT EMP	PLOYMENT
Institution where employed	FESB - Split
Date of employment	08.06.2001.
Name of position (professor,	
researcher, associate teacher,	Assistant professor
etc.)	-
Field of research	Signal processing, speech recognition, localization
Function	
INFORMATION ON EDUCATION –	Highest degree earned
Degree	Ph.D.
Institution	FESB – Split
Place	Split
Date	29.06.2010.
INFORMATION ON ADDITIONAL T	RAINING
Year	
Place	
Institution	
Field of training	
MOTHER TONGUE AND FOREIGN	LANGUAGES
Mother tongue	Croatian
Foreign language and command of	
foreign language on a scale from 2 (sufficient) to 5 (excellent)	English, 4
Foreign language and command of foreign language on a scale from 2	Italian 2
(sufficient) to 5 (excellent)	
Foreign language and command of	
foreign language on a scale from 2	
(sufficient) to 5 (excellent)	
COMPETENCES FOR THE COURSE	
Earlier experience as course	
leacher of similar courses (name	

title of course, study programme where it is/was offered, and level of study programme)	
Authorship of university/faculty	
	Sikora, Marjan; Grčić, Đana; Russo, Mladen. A tool for soundscape auralization of ancient archaeological sites // Proceedings of 7th congress of Alps Adria Acoustic Association,Ljubljana, Slovenija, 2016. Russo, Mladen; Stella, Maja; Kurajica, Maroje. Cochlear Model based Enhancement of Noisy Speech Signals. // International Journal of Circuits, Systems and Signal Processing. 9 (2015), 446-454.
	Stella, Maja; Russo, Mladen; Begušić, Dinko. Fingerprinting based localization in heterogeneous wireless networks // Expert systems with applications, 41 (2014), 15; 6738-6747.
Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)	Šarić, Matko; Dujmić, Hrvoje; Russo, Mladen. Scene Text Extraction in HSI Color Space using K-means Algorithm and Modified Cylindrical Distance // Przegląd elektrotechniczny, 5 (2013) 117-121.
	Russo, Mladen; Šolić, Petar; Stella, Maja. Probabilistic Modeling of Harvested GSM Energy and its Application in Extending UHF RFID Tags Reading Range // Journal of electromagnetic waves and applications, 27 (2013), 4; 473- 484.
	Primorac, Sanja; Russo, Mladen. Android Application for Sending SMS Messages with Speech Recognition Interface // Proceedings of the 35th International Convention MIPRO, 2012.
	Russo, Mladen; Stella, Maja; Rožić, Nikola. Noise reduction in speech signals using a cochlear model. // Advances in Smart Systems Research. 2 (2012), 1; 7-12.
Professional and scholarly articles published in the last five years in subjects of teaching methodology and teaching quality (5 works at most)	
Professional, science and artistic projects in the field of the course carried out in the last five years (5 at most)	ELISE: Easy Living in Smart Environments, HRZZ, project leader Mladen Russo, Ph.D., 2015. – 2018. Advanced Interface for Simpler Human-Computer Interaction, SDŽ, project leader Mladen Russo, Ph.D., 2015. – 2017. ICT Systems and Services Based on Integration of Information, MZOS, project leader Nikola Rožić, Ph.D., 2007. – 2013.
The name of the programme and the volume in which the main teacher passed exams in/acquired the methodological-psychological- didactic-pedagogical group of competences?-pedagoške kompetencije?	
PRIZES AND AWARDS, STUDENT	EVALUATION
and scholarly/artistic work	
Results of student evaluation taken in the last five years for the course	

that is comparable to the course	
described in the form (evaluation	
organizer, average grade, note on	
grading scale and course	
evaluated)	

First and last name and title of teacher	Petar Sarajčev, Ph.D., Associate Professor
The course he/she teaches in the proposed study programme	Electrical Networks High Voltage Engineering Protection at Substations
GENERAL INFORMATION ON COUL	RSE TEACHER
Address	R. Boškovića 32, HR-21000, Split
Telephone number	+385 21 305806
E-mail address	petar.sarajcev@fesb.hr
Personal web page	
Year of birth	1976.
Scientist ID	272943
Research or art rank, and date of last rank appointment	Scientific Adviser, 10/03/2016
Research-and-teaching, art-and- teaching or teaching rank, and date of last rank appointment	Associate Professor, 16/05/2012
Area and field of election into research or art rank	Technical sciences, Field Electrical engineering
INFORMATION ON CURRENT EMP	LOYMENT
Institution where employed	Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture
Date of employment	01/03/2009
Name of position (professor, researcher, associate teacher, etc.)	Associate Professor
Field of research	Power system analysis
Function	
INFORMATION ON EDUCATION - H	lighest degree earned
Degree	PhD
Institution	Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture
Place	Split
Date	15/04/2008
INFORMATION ON ADDITIONAL TR	AINING
Year	
Place	
Institution	
Field of training	
MOTHER TONGUE AND FOREIGN	LANGUAGES
Mother tongue	Croatian
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	English (5)
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	Italian (2)
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	

COMPETENCES FOR THE COURSE		
Earlier experience as course teacher of similar courses (name title of course, study programme where it is/was offered, and level of study programme)	High voltage engineering, Graduate study	
Authorship of university/faculty textbooks in the field of the course		
Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)	<ol> <li>P. Sarajčev, J. Vasilj, R. Goić, Monte Carlo analysis of wind farm surge arresters risk of failure due to lightning surges, Renewable Energy, Vol. 57, pp. 626-634, 2013.</li> <li>J. Vasilj, P. Sarajčev, R. Goić, Modeling of current-limiting air- core series reactor for transient recovery voltage studies, Electric power systems research, Vol. 117, pp. 185-191, 2014.</li> <li>P. Sarajcev, J. Vasilj, D. Jakus, Monte–Carlo analysis of wind farm lightning- surge transients aided by LINET lightning- detection network data, Renewable Energy, Vol. 99, pp. 501- 513, 2016.</li> </ol>	
Professional and scholarly articles published in the last five years in subjects of teaching methodology and teaching quality (5 works at most)		
Professional, science and artistic projects in the field of the course carried out in the last five years (5 at most)		
The name of the programme and the volume in which the main teacher passed exams in/acquired the methodological-psychological- didactic-pedagogical group of competences?-pedagoške kompetencije?		
PRIZES AND AWARDS, STUDENT E	PRIZES AND AWARDS, STUDENT EVALUATION	
Prizes and awards for teaching and scholarly/artistic work		
Results of student evaluation taken in the last five years for the course that is comparable to the course described in the form (evaluation organizer, average grade, note on grading scale and course evaluated)		

First and last name and title of teacher	lvica Sorić, senior lecturer
The course he/she teaches in the proposed study programme	Physics
GENERAL INFORMATION ON COL	IRSE TEACHER
Address	21252 Tugare, Kneza Trpimira 61
Telephone number	+385 21 305 872
E-mail address	suri@fesb.hr
Personal web page	http://marjan.fesb.hr/~suri/
Year of birth	1964.
Scientist ID	170745
Research or art rank, and date of	
last rank appointment	
Research-and-teaching, art-and-	
teaching or teaching rank, and	Senior lecturer, 19/04/2012.
date of last rank appointment	
Area and field of election into	Natural science   Dhysics   Constal physics
research or art rank	Natural Science   Physics   General physics
INFORMATION ON CURRENT EMP	PLOYMENT
Institution where employed	FESB - Split
Date of employment	1989.
Name of position (professor,	
researcher, associate teacher,	Senior lecturer
etc.)	Natural acianae   Dhuring   Canaral nhuring
Field of research	Natural science   Physics   General physics
INFORMATION ON EDUCATION -	Highest degree earned
Degree	VSS
Institution	naval architecture
Place	Split
Date	15. 04. 1989.
INFORMATION ON ADDITIONAL T	RAINING
Year	1994-2001 (occasionally residence, 10 months altogether)
Place	Geneva
Institution	CERN
Field of training	Fizika
MOTHER TONGUE AND FOREIGN	LANGUAGES
Mother tongue	Croatian
Foreign language and command of	
foreign language on a scale from 2	English (3)
(sufficient) to 5 (excellent)	
Foreign language and command of	
foreign language on a scale from 2	
Ecroign language and command of	
foreign language on a coole from 2	
(sufficient) to 5 (excellent)	
	E
Earlier experience on course	
teacher of similar courses (name	Physics Undergraduated study of Chamical Technology and
title of course, study programme	Figsics, Ondergraduated study of Chemical Technology and
where it is/was offered, and lovel of	Faculty of Chemistry and Technology, Split
study programme)	r acuity of chemistry and rechnology, Split
	S Botrić N Godinović M Grbac I Puliak I Sorić
Authorship of university/faculty	Laboratorijske vježbe iz Fizike, 2006
textbooks in the field of the course	

	M. Grbac, I. Sorić: Fizika za inženjere, course book of Physics for programme of undergraduated studies (in progress)
Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)	Županović, Paško; Sorić, Ivica; Sorić, Tomislav. Stirling engine as simple as possible // Proceedings / Piloteelli, Mariagrazia ; Beretta, Gian Paolo (ur.). Brescia : Cartolibreria Snoopy, 2013. 510-513 (pozvano predavanje,međunarodna recenzija,sažetak,znanstveni).
Professional and scholarly articles published in the last five years in subjects of teaching methodology and teaching quality (5 works at most)	
Professional, science and artistic projects in the field of the course carried out in the last five years (5 at most)	
The name of the programme and the volume in which the main teacher passed exams in/acquired the methodological-psychological- didactic-pedagogical group of competences?-pedagoške kompetencije?	
PRIZES AND AWARDS, STUDENT	EVALUATION
Prizes and awards for teaching and scholarly/artistic work	
Results of student evaluation taken in the last five years for the course that is comparable to the course described in the form (evaluation organizer, average grade, note on grading scale and course evaluated)	

First and last name and title of teacher	Ivo Stančić, Ph.D., Assistant Professor
The course he/she teaches in the proposed study programme	Microcontrollers and embedded network systems
GENERAL INFORMATION ON COL	IRSE TEACHER
Address	R Boškovića 32
Telephone number	+ 385 (0)21 305 879
E-mail address	istancic@fesb.hr
Personal web page	http://marjan.fesb.hr/~istancic/
Year of birth	1984.
Scientist ID	291143
Research or art rank, and date of last rank appointment	Research associate (October 2013)
Research-and-teaching, art-and- teaching or teaching rank, and date of last rank appointment	Assistant professor (March 2017)
Area and field of election into research or art rank	Technical sciences, Electrical engineering
INFORMATION ON CURRENT EMP	PLOYMENT
Institution where employed	Faculty of electrical engineering, mechanical engineering and naval architecture, University of Split
Date of employment	4.5.2007.
Name of position (professor, researcher, associate teacher, etc.)	Assistant professor
Field of research	Electrical engineering / electronics
Function	1
INFORMATION ON EDUCATION -	Highest degree earned
Degree	PhD
Institution	Faculty of electrical engineering, mechanical engineering and naval architecture, University of Split
Place	Split
Date	30. 11. 2012.
INFORMATION ON ADDITIONAL T	RAINING
Year	
Place	
Institution	
Field of training	
MOTHER TONGUE AND FOREIGN	LANGUAGES
Mother tongue	Croatian
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	English (5)
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	Italian (2)
COMPETENCES FOR THE COURS	E
Earlier experience as course teacher of similar courses (name title of course, study programme where it is/was offered, and level of study programme)	
Authorship of university/faculty textbooks in the field of the course	M. Bonković, J. Musić, I. Stančić, Microcontrollers and embedded network systems based on Arduino development environment, faculty script, 2014.

	1. Stančić, Ivo; Musić, Josip; Grujić, Tamara "Gesture Recognition System for Real-time Mobile Robot Control Based on Inertial Sensors and Motion Strings", Engineering applications of artificial intelligence. 66 (2017) ; 33-48
	2. Stančić, Ivo; Bugarić, Marin; Perković, Toni, "Active IR System for Projectile Detection and Tracking", Advances in Electrical and Computer Engineering. 17 (2017) , 4; 133-138
Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)	3. Stančić, Ivo; Jukić, Jelena; Musić, Josip. "Prototype of the Energy Efficient Device for Measurement and Analysis of Impacts During Small Parcel Shipping", Journal of testing and evaluation. 47 (2019), 2;
	<ol> <li>Stančić, Ivo; Brajović, Miloš; Orović, Irena; Musić, Josip. Compressive sensing for reconstruction of 3D point clouds in smart systems</li> </ol>
	5. Josip Musić, Stanko Kružić, Ivo Stančić, Vladan Papić, Adaptive Fuzzy Mediation for Multimodal Control of Mobile Robots in Navigation-based Tasks, International Journal of Computational Intelligence Systems Volume 12, Issue 2, Year 2019, On page(s): 1197 - 1211
Professional and scholarly articles published in the last five years in subjects of teaching methodology and teaching quality (5 works at most)	
	1. Compressive sensing and super-resolution in surveillance systems based on optical sensors and UAVs, 2015-2017, Bilateral Croatia-Montenegro cooperation, researcher.
Professional science and artistic	2. Supervised and unsupervised learning from imbalanced datasets for assistance in movement of persons with low vision, 2014-2015, Bilateral Croatia-Slovenia cooperation, researcher.
projects in the field of the course carried out in the last five years (5 at most)	3. Prototyping a module for automatization of industrial floor scrubbers, 2014-2016, Split-Dalmatia county and Odabir d.o.o., researcher.
	4. Development and implementation of methods for identification of bio-system and environment, 2014 - , Faculty/University project, researcher.
	5. Biomechanics of human motion, control and rehabilitation, 2007-2014, Ministry of science, education and sports, researcher.
The name of the programme and the volume in which the main teacher passed exams in/acquired the methodological-psychological- didactic-pedagogical group of competences.	
PRIZES AND AWARDS, STUDENT	EVALUATION
Prizes and awards for teaching and scholarly/artistic work	FESTO prize for young scientist and researchers DAAAM Symposium "Intelligent Manufacturing & Automation, Vienna, Austria, 26.11.2011.

	Best paper award in "Symposium on Smart Environment Technologies" during SofCOM 2016 conference.
Results of student evaluation	
taken in the last five years for the	
course that is comparable to the	
course described in the form	
(evaluation organizer, average	
grade, note on grading scale and	
course evaluated)	

First and last name and title of teacher	Darko Stipaničev, Ph.D., Full Professor
The course he/she teaches in the proposed study programme	Process Control
GENERAL INFORMATION ON COL	JRSE TEACHER
Address	Matoševa 26. 21000 Split
Telephone number	+385 91 4305 643
E-mail address	darko.stipanicev@fesb.hr
Personal web page	http://laris.fesb.hr/dstip-e.html
Year of birth	1955
Scientist ID	44861
Research or art rank, and date of	Scientific Adviser in Computer Science, 2006
last rank appointment	Scientific Adviser in Electrical Engineering, 1997
Research-and-teaching, art-and-	
teaching or teaching rank, and	Senior Full Professor, 2002
date of last rank appointment	
Area and field of election into	Lechnical Systems, Field Electrical engineering
research of art rank	recinical Systems, Fireid Computer sciences
INFORMATION ON CURRENT EMI	PLOYMENT
Institution where employed	Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture
Date of employment	1981
Name of position (professor,	
researcher, associate teacher,	Professor
etc.)	
Field of research	Computer Science – Artificial Intelligence, Electrical Engineering - Automatic Control
Function	Head of Chair of Modelling and Intelligent Systems
INFORMATION ON EDUCATION -	Highest degree earned
Degree	PhD
Institution	Electrotechnical Faculty University of Zagreb
Place	Zagreb
Date	1987
INFORMATION ON ADDITIONAL T	RAINING
Year	1988-89
Place	London
Institution	Queen Mary College
Field of training	post-doctoral specialisation
MOTHER TONGUE AND FOREIGN	LANGUAGES
Mother tongue	Croatian
Foreign language and command	
of foreign language on a scale	English (5)
from 2 (sufficient) to 5 (excellent)	
Foreign language and command	
or roreign language on a scale	italian (4)
Foreign language and command	
of foreign language on a scale	
from 2 (sufficient) to 5 (excellent)	
COMPETENCES FOR THE COURS	SE
Earlier experience as course	Disprete regulation systems (1099, 2005)
teacher of similar courses (name	Automatic control 2 (2005 danas)
title of course, study programme	Digital control (2005-today)
where it is/was offered, and level	Intelligent control of complex systems (1991-1995)
of study programme)	

Authorship of university/faculty textbooks in the field of the course	D.Stipaničev, J.Marasović, Digitalno vođenje on-line (Digital control on-line), on-line (Web) book, MZT – Informatički projekt, 2004. <u>http://laris.fesb.hr/digitalno_vodjenje</u>
Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)	<ol> <li>D.Stipaničev, J.Božičević, Fuzzy Feedforward and Composite Control, Transaction Inst. Measurement and Control (UK), 8(2), 1986, pp. 67-75</li> <li>D.Stipaničev, Vođenje i zaštita vjetroelektrana u autonomnom elektro-energetskom sistemu, Sunčana energija, 8(2), 1987, pp.91-96</li> <li>D.Stipaničev, Diskretno vođenje složenih sustava adaptivnim, nelinearnim PID regulatorima, Elektrotehnika, 34(3-4), 1991, pp.153-161</li> <li>D.Stipaničev, Fuzzy Relational Models for Intelligent Control, u knizi R. Hanus, P.Kool, S.Tzafestas(ed) "Mathematical and Intelligent Models in System Simulation", J.C.Baltzer AG Scientific Pub.Co., 1991, pp.275-279</li> <li>M.De Neyer, D.Stipaničev, R.Gorez, Intelligent Self- organising Controllers and their Application to the Control of Dynamic Systems, u knjizi R.Hanus, P.Kool, S.Tzafestas(ed) "Mathematical and Intelligent Models in System Simulation", J.C.Baltzer AG Scientific Pub.Co., 1991, pp.287-292</li> </ol>
Professional and scholarly articles published in the last five years in subjects of teaching methodology and teaching quality (5 works at most)	
Professional, science and artistic projects in the field of the course carried out in the last five years (5 at most)	<ol> <li>Project Vision based intelligent observers (ViO) (2012 – 2016)</li> <li>Project 023-0232005-2003 – AgISEco – Agent based intelligent systems for environmental monitoring, Contract with Ministary of Science RH (2006 - 2012)</li> </ol>
The name of the programme and the volume in which the main teacher passed exams in/acquired the methodological-psychological- didactic-pedagogical group of competences?-pedagoške kompetencije?	
PRIZES AND AWARDS, STUDENT	EVALUATION
Prizes and awards for teaching and scholarly/artistic work	
Results of student evaluation taken in the last five years for the course that is comparable to the course described in the form (evaluation organizer, average grade, note on grading scale and course evaluated)	4,4/5

First and last name and title of teacher	Elis Sutlović, Ph.D., Full Professor
The course he/she teaches in the proposed study programme	Protection and control systems in substation, Energy sources
GENERAL INFORMATION ON COL	JRSE TEACHER
Address	Kranjčevićeva 28, Split
Telephone number	091 630 5730
E-mail address	Elis.Sutlovic@fesb.hr
Personal web page	
Year of birth	1961.
Scientist ID	122652
Research or art rank, and date of	Scientific Adviser, 16.12.2010.
last rank appointment	,
Research-and-teaching, art-and-	Soniar Full Professor 25.02.2016
date of last rank appointment	Senior Full Floressor, 23.02.2010.
Area and field of election into	
research or art rank	Technical Sciences, Field Electrical engineering
INFORMATION ON CURRENT EMP	PLOYMENT
Institution where employed	Faculty of Electrical Engineering. Mechanical Engineering and
	Naval Architecture
Date of employment	24.10.1984.
Name of position (professor,	Professor
researcher, associate teacher,	
etc.)	
Field of research	Power system planning and analysis, Power system operation
	and control
Function	Head of Chair of Electrical facilities and power systems
INFORMATION ON EDUCATION –	Highest degree earned
INFORMATION ON EDUCATION – Degree	Highest degree earned PhD Foundation of Electrical Engineering, Machanical Engineering, and
INFORMATION ON EDUCATION – Degree Institution	Highest degree earned PhD Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture
INFORMATION ON EDUCATION – Degree Institution	Highest degree earned PhD Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture Split
INFORMATION ON EDUCATION – Degree Institution Place Date	Highest degree earned PhD Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture Split 2001.
INFORMATION ON EDUCATION – Degree Institution Place Date	Highest degree earned PhD Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture Split 2001. RAINING
INFORMATION ON EDUCATION – Degree Institution Place Date INFORMATION ON ADDITIONAL T Year	Highest degree earned PhD Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture Split 2001. RAINING
INFORMATION ON EDUCATION – Degree Institution Place Date INFORMATION ON ADDITIONAL T Year Place	Highest degree earned PhD Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture Split 2001. RAINING
INFORMATION ON EDUCATION – Degree Institution Place Date INFORMATION ON ADDITIONAL T Year Place Institution	Highest degree earned PhD Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture Split 2001. RAINING
INFORMATION ON EDUCATION – Degree Institution Place Date INFORMATION ON ADDITIONAL T Year Place Institution Field of training	Highest degree earned PhD Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture Split 2001. RAINING
INFORMATION ON EDUCATION – Degree Institution Place Date INFORMATION ON ADDITIONAL T Year Place Institution Field of training MOTHER TONGUE AND FOREIGN	Highest degree earned PhD Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture Split 2001. RAINING LANGUAGES
INFORMATION ON EDUCATION – Degree Institution Place Date INFORMATION ON ADDITIONAL T Year Place Institution Field of training MOTHER TONGUE AND FOREIGN Mother tongue	Highest degree earned PhD Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture Split 2001. RAINING LANGUAGES Croatian
INFORMATION ON EDUCATION – Degree Institution Place Date INFORMATION ON ADDITIONAL T Year Place Institution Field of training MOTHER TONGUE AND FOREIGN Mother tongue Foreign language and command of	Highest degree earned PhD Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture Split 2001. RAINING LANGUAGES Croatian English (4)
INFORMATION ON EDUCATION – Degree Institution Place Date INFORMATION ON ADDITIONAL T Year Place Institution Field of training MOTHER TONGUE AND FOREIGN Mother tongue Foreign language and command of foreign language on a scale from 2	Highest degree earned PhD Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture Split 2001. RAINING LANGUAGES Croatian English (4)
INFORMATION ON EDUCATION – Degree Institution Place Date INFORMATION ON ADDITIONAL T Year Place Institution Field of training MOTHER TONGUE AND FOREIGN Mother tongue Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	Highest degree earned PhD Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture Split 2001. RAINING LANGUAGES Croatian English (4)
INFORMATION ON EDUCATION – Degree Institution Place Date INFORMATION ON ADDITIONAL T Year Place Institution Field of training MOTHER TONGUE AND FOREIGN Mother tongue Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent) Foreign language and command of	Highest degree earned PhD Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture Split 2001. RAINING LANGUAGES Croatian English (4)
INFORMATION ON EDUCATION – Degree Institution Place Date INFORMATION ON ADDITIONAL T Year Place Institution Field of training MOTHER TONGUE AND FOREIGN Mother tongue Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent) Foreign language on a scale from 2	Highest degree earned PhD Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture Split 2001. RAINING LANGUAGES Croatian English (4)
INFORMATION ON EDUCATION – Degree Institution Place Date INFORMATION ON ADDITIONAL T Year Place Institution Field of training MOTHER TONGUE AND FOREIGN Mother tongue Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent) Foreign language on a scale from 2 (sufficient) to 5 (excellent)	Highest degree earned PhD Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture Split 2001. RAINING LANGUAGES Croatian English (4)
INFORMATION ON EDUCATION – Degree Institution Place Date INFORMATION ON ADDITIONAL T Year Place Institution Field of training MOTHER TONGUE AND FOREIGN Mother tongue Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent) Foreign language on a scale from 2 (sufficient) to 5 (excellent) Foreign language and command of foreign language and command of foreign language and command of foreign language and command of foreign language and command of	Highest degree earned PhD Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture Split 2001. RAINING LANGUAGES Croatian English (4)
INFORMATION ON EDUCATION – Degree Institution Place Date INFORMATION ON ADDITIONAL T Year Place Institution Field of training MOTHER TONGUE AND FOREIGN Mother tongue Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent) Foreign language on a scale from 2 (sufficient) to 5 (excellent) Foreign language on a scale from 2 (sufficient) to 5 (excellent) Foreign language on a scale from 2 (sufficient) to 5 (excellent)	Highest degree earned PhD Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture Split 2001. RAINING LANGUAGES Croatian English (4)
INFORMATION ON EDUCATION – Degree Institution Place Date INFORMATION ON ADDITIONAL T Year Place Institution Field of training MOTHER TONGUE AND FOREIGN Mother tongue Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent) Foreign language on a scale from 2 (sufficient) to 5 (excellent) Foreign language on a scale from 2 (sufficient) to 5 (excellent) Foreign language on a scale from 2 (sufficient) to 5 (excellent) Foreign language on a scale from 2 (sufficient) to 5 (excellent)	Highest degree earned PhD Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture Split 2001. RAINING LANGUAGES Croatian English (4)
INFORMATION ON EDUCATION – Degree Institution Place Date INFORMATION ON ADDITIONAL T Year Place Institution Field of training MOTHER TONGUE AND FOREIGN Mother tongue Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent) Foreign language on a scale from 2 (sufficient) to 5 (excellent) Foreign language on a scale from 2 (sufficient) to 5 (excellent) Foreign language on a scale from 2 (sufficient) to 5 (excellent) Foreign language on a scale from 2 (sufficient) to 5 (excellent) Foreign language on a scale from 2 (sufficient) to 5 (excellent)	Highest degree earned PhD Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture Split 2001. RAINING LANGUAGES Croatian English (4)
INFORMATION ON EDUCATION – Degree Institution Place Date INFORMATION ON ADDITIONAL T Year Place Institution Field of training MOTHER TONGUE AND FOREIGN Mother tongue Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent) Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent) Foreign language on a scale from 2 (sufficient) to 5 (excellent) Foreign language on a scale from 2 (sufficient) to 5 (excellent) Foreign language on a scale from 2 (sufficient) to 5 (excellent) Foreign language on a scale from 2 (sufficient) to 5 (excellent) COMPETENCES FOR THE COURS Earlier experience as course teacher of similar courses (name	Highest degree earned PhD Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture Split 2001. RAINING LANGUAGES Croatian English (4)  EE Power engineering, Graduate study programme, Power engineering, Graduate study programe, Power engineering, Graduate study progra
INFORMATION ON EDUCATION – Degree Institution Place Date INFORMATION ON ADDITIONAL T Year Place Institution Field of training MOTHER TONGUE AND FOREIGN Mother tongue Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent) Foreign language on a scale from 2 (sufficient) to 5 (excellent) Foreign language on a scale from 2 (sufficient) to 5 (excellent) Foreign language on a scale from 2 (sufficient) to 5 (excellent) Foreign language on a scale from 2 (sufficient) to 5 (excellent) Foreign language on a scale from 2 (sufficient) to 5 (excellent) COMPETENCES FOR THE COURS Earlier experience as course teacher of similar courses (name title of course study programme	Highest degree earned         PhD         Faculty of Electrical Engineering, Mechanical Engineering and         Naval Architecture         Split         2001.         RAINING
INFORMATION ON EDUCATION – Degree Institution Place Date INFORMATION ON ADDITIONAL T Year Place Institution Field of training MOTHER TONGUE AND FOREIGN Mother tongue Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent) Foreign language on a scale from 2 (sufficient) to 5 (excellent) Foreign language on a scale from 2 (sufficient) to 5 (excellent) Foreign language on a scale from 2 (sufficient) to 5 (excellent) Foreign language on a scale from 2 (sufficient) to 5 (excellent) Foreign language on a scale from 2 (sufficient) to 5 (excellent) COMPETENCES FOR THE COURS Earlier experience as course teacher of similar courses (name title of course, study programme where it is/was offered, and level	Highest degree earned         PhD         Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture         Split         2001.         RAINING         LANGUAGES         Croatian         English (4)         SE         Power engineering, Graduate study programme, Power system control, Graduate study programme

Authorship of university/faculty	Ivan Medić, Elis Sutlović: Električna postrojenja, upute za
	045-3, Split, 2014.
Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)	<ol> <li>Ivan Ramljak, Matislav Majstrović, Elis Sutlović: Statistical Analysis of Particles of Conductor Clashing, <i>Proceeding of</i> <i>IEEE EnergyCon 2014</i>, pp. 671-676, May 13-16, 2014, Dobrovnik, Croatia</li> </ol>
	<ol> <li>Elis Sutlović, Snježana Čujić Čoko, Ivan Medić: Characteristics of basin inflows a statistical analysis for long-term/mid-term hydrothermal scheduling, Thermal Science Journal, Vol 18/3, pp. 9-809, 2014.</li> </ol>
	<ol> <li>Ivan Ramljak, Elis Sutlović, Matislav Majstrović: Statistical analysis of conductor clashing particles in low-voltage distribution network, INFOTEH-JAHORINA Vol. 14, March 2015.</li> </ol>
	<ol> <li>M. Majstrović, E. Sutlović, I. Ramljak, "Critical diameter of particles produced in overhead line conductor clashing", <i>Applied thermal engineering</i>, Vol 114, pp. 713-718, 2017.</li> </ol>
Professional and scholarly articles published in the last five years in subjects of teaching methodology and teaching quality (5 works at most)	
Professional, science and artistic projects in the field of the course carried out in the last five years (5 at most)	<ol> <li>MZOŠ Istraživački projekt: Power system expansion and operation with large scale integration of wind power, 2006-2012.</li> <li>VIF FESB: Analiza energetskih tokova u kompleksnom energetskom sustavu, 2015-2017.</li> </ol>
The name of the programme and the volume in which the main teacher passed exams in/acquired the methodological-psychological- didactic-pedagogical group of competences?-pedagoške kompetencije?	
PRIZES AND AWARDS, STUDENT	EVALUATION
Prizes and awards for teaching and scholarly/artistic work	
Results of student evaluation taken in the last five years for the course that is comparable to the course described in the form (evaluation organizer, average grade, note on grading scale and course evaluated)	4,8/5

First and last name and title of teacher	Matko Šarić, Ph.D., Assstant Professor
The course he/she teaches in the	
proposed study programme	Communication Systems
GENERAL INFORMATION ON COL	IRSE TEACHER
Address	Pojišanska 25, 21000 Split
Telephone number	0914305633
E-mail address	msaric@fesb.hr
Personal web page	
Year of birth	1980
Scientist ID	272954
Research or art rank, and date of	Assistant research scientist 16 6 2011
last rank appointment	
Research-and-teaching, art-and-	
teaching or teaching rank, and	Assistant professor, September 2014.
date of last rank appointment	
Area and field of election into	Computer science information processing
research or art rank	computer colorice, merination proceeding
INFORMATION ON CURRENT EMP	PLOYMENT
Institution where employed	Faculty of Electrical Engineering, Mechanical Engineering and
	Naval Architecture, University of Split (FESB Split)
Date of employment	1.6.2004.
Name of position (professor,	
researcher, associate teacher,	Assistant professor
etc.)	
Field of research	Computer vision
Function	
INFORMATION ON EDUCATION –	Highest degree earned
Degree	Ph.D. in Electrical Engineering and Information Technology, FESB (Split)
Institution	Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture. University of Split (FESB Split)
Place	Split
Date	13.10.2010.
INFORMATION ON ADDITIONAL T	RAINING
Year	
Place	
Institution	
Field of training	
MOTHER TONGUE AND FOREIGN	LANGUAGES
Mother tongue	Croatian
Foreign language and command of	
foreign language on a scale from 2	English - 4
(sufficient) to 5 (excellent)	C C C C C C C C C C C C C C C C C C C
Foreign language and command of	
foreign language on a scale from 2	German - 2
(sufficient) to 5 (excellent)	
Foreign language and command of	
foreign language on a scale from 2	
(sufficient) to 5 (excellent)	
COMPETENCES FOR THE COURS	E
Earlier experience as course	Multimedia systems, graduate study of electrical
teacher of similar courses (name	engineering
title of course, study programme	<ul> <li>Signals and systems, undergraduate study of</li> </ul>
where it is/was offered, and level	electrical engineering and information technology
of study programme)	Algorithms, , undergraduate study of compter science
Authorship of university/faculty	
textbooks in the field of the course	

Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)	<ol> <li>Šarić, Matko; Dujmić, Hrvoje; Russo, Mladen. Scene Text Extraction in IHLS Color Space Using Support Vector Machine. // Information Technology And Control. 44 (2015) , 1; 20-29</li> <li>Šarić, Matko; Dujmić, Hrvoje; Russo, Mladen. Scene Text Extraction in HSI Color Space using K-means Algorithm and Modified Cylindrical Distance. // Przegląd elektrotechniczny. 5 (2013) ; 117-121</li> <li>Šarić, Matko; Stella, Maja; Šolić, Petar. Scene Text Extraction using K-means Clustering in HSI Color Space: Influence of Color Distance Measure. // INTERNATIONAL JOURNAL OF CIRCUITS, SYSTEMS AND SIGNAL PROCESSING. 7 (2013) , 5; 294-301</li> <li>Šarić, Matko; Stella, Maja; Šolić, Petar. Extraction of Scene Text in HSI Color Space using K-means Clustering with Chromatic and Intensity Distance // Recent advances in information sciences - Proceeedings of the 5th European conference of compute science (ECCS'13). 2013. 136-141</li> <li>Dujmić, Hrvoje; Šarić, Matko; Radić, Joško. Scene text extraction using modified cylindrical distance // Recent Researches in Neural Networks, Fuzzy Systems, Evolutionary Computing and Automation (Proceedings of 12th WSEAS conference on Automation &amp; Information). Brasov, 2011. 213-218</li> </ol>
Professional and scholarly articles published in the last five years in subjects of teaching methodology and teaching quality (5 works at most)	
Professional, science and artistic projects in the field of the course carried out in the last five years (5 at most)	<ul> <li>MZOŠ project "ICT systems and services based on information integration" (20072012.)</li> <li>HRZZ project "ELISE: Easy Living in Smart Environments" (2015)</li> </ul>
The name of the programme and the volume in which the main teacher passed exams in/acquired the methodological-psychological- didactic-pedagogical group of competences?-pedagoške kompetencije?	
PRIZES AND AWARDS, STUDENT	EVALUATION
Prizes and awards for teaching and scholarly/artistic work	
Results of student evaluation taken in the last five years for the course that is comparable to the course described in the form (evaluation organizer, average grade, note on grading scale and course evaluated)	

First and last name and title of teacher	Antonio Šarolić, Ph.D., Full Professor
The course he/she teaches in the	Antennas
proposed study programme	Maritime Radiocommunications
	Practicum in Electromagnetic Simulations
GENERAL INFORMATION ON CO	
Address	FESB, Rudera Boskovica 32, 21000 Split
E mail address	021 305 700
E-mail address	dillonio.salolic@lesb.ni
Year of hirth	
Scientist ID	223/30
Research or art rank and date of	220400
last rank appointment	Scientific Advisor, 2016.
Research-and-teaching, art-and-	
teaching or teaching rank, and	Full Profesor, 2016.
date of last rank appointment	
Area and field of election into	Area: Technical Sciences, Field: Electrical Engineering
research or art rank	
INFORMATION ON CURRENT EM	PLOYMENT
Institution where employed	Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture
Date of employment	1.1.2006.
Name of position (professor,	
researcher, associate teacher, etc.)	Full Profesor
Field of research	Applied electromagnetics, wireless communications
Function	Head of Chair for Applied Electromagnetic Fields
INFORMATION ON EDUCATION -	- Highest degree earned
Degree	PhD
Institution	FER, University of Zagreb
Place	
Mother tongue	
Foreign language and command	
of foreign language on a scale	English 5
from 2 (sufficient) to 5 (excellent)	
Foreign language and command	
of foreign language on a scale	Italian, 2
from 2 (sufficient) to 5 (excellent)	
COMPETENCES FOR THE COUR	SE
	Šarolić, Antonio; Modlic, Borivoj.
	Measurement of Electric Field Probe Response to Modulated
	Signals Using Waveguide Setup. // IEEE antennas and
	wireless propagation letters. 9 (2010) ; 1041-1044
Professional, scholarly and artistic	Sarolic, Antonio; Senic, Damir; Zivkovic, Zlatko.
articles published in the last five	Raulation Pattern of a ventical Dipole over Sea and Setup for Measuring thereof // Automatika, 53 (2012), 1, 56,69
years in the field of the course (5	weasunny mereor. // Automatika. 55 (2012) , 1, 50-00
works at most)	Šarolić Antonio Matić Petar
	Wireless LAN Electromagnetic Field Prediction for Indoor
	Environment Using Artificial Neural Network. // Automatika. 51
	(2010) , 3; 233-240
	Żivković, Zlatko; Šarolić, Antonio.

	Measurements of Antenna Parameters in GTEM Cell. // Journal of communications software and systems. 6 (2010) ; 125-132
	Živković, Zlatko; Senić, Damir; Šarolić, Antonio; Vučić, Ante. Design and Testing of a Diode-Based Electric Field Probe Prototype // 19th International Conference on Software, Telecommunications & Computer Networks - SoftCOM 2011. Split, 2011. 1-5
Professional, science and artistic projects in the field of the course carried out in the last five years (5 at most)	<ul> <li>Ongoing projects: <ul> <li>Chair of EU COST project Action BM1309: "European network for innovative uses of EMFs in biomedical applications", 2014-</li> <li>EU COST Action IC1102: "Versatile, Integrated, and Signal-aware Technologies for Antennas (VISTA)", Management Committee Member, 2011-</li> </ul> </li> <li>Completed projects: <ul> <li>Principal investigator of research project MZOŠ RH</li> <li>"Measurements in EMC and EM health effects research", 2008-2013.</li> <li>Leader of technological project BICRO PoC4_06_23 "Integral system of radiocommunications and vessel surveillance in marinas", 2013-2014.</li> <li>EU COST Action IC1004: "Cooperative Radio Communications for Green Smart Environments", Management Committee Member, 2011-2015.</li> </ul> </li> </ul>
PRIZES AND AWARDS, STUDENT	EVALUATION
and scholarly/artistic work	
Results of student evaluation taken in the last five years for the course that is comparable to the course described in the form (evaluation organizer, average grade, note on grading scale and course evaluated)	Student evaluations in academic year 2016/17: - "Wireless communications": average grade 4,7 out of 5 - "Antenna systems": average grade 5 out of 5 - "Electromagnetic compatibility": average grade 4,9 out of 5 - "Simulation and measurement of electromagnetic quantities": average grade 4,8 out of 5

First and last name and title of teacher	Ljiljana Šerić, Ph.D., Assistant Professor
The course he/she teaches in the	Introduction to Programming
proposed study programme	Internet Programming
GENERAL INFORMATION ON COUI	RSE TEACHER
Address	FESB, Ruđera Boškovića 32, 21000 Split
Telephone number	+385 (0)21 305 651
E-mail address	ljiljana.seric@fesb.hr
Personal web page	http://www.fesb.hr/~ljiljana
Year of birth	1979.
Scientist ID	272906
Research or art rank, and date of	Senior Research Associate 1/ 02 2013
last rank appointment	
Research-and-teaching, art-and-	
teaching or teaching rank, and date	Assistant professor, 02.12.2013.
of last rank appointment	
Area and field of election into	Technical sciencies, Computer Science
research or art rank	· · ·
INFORMATION ON CURRENT EMPI	LOYMENT
Institution where employed	University of Split, Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture
Date of employment	02.12.2013.
Name of position (professor,	Assistant professor
researcher, associate teacher, etc.)	
Field of research	Science and education
Function	Assistant professor
INFORMATION ON EDUCATION - H	lighest degree earned
Degree	PhD
Institution	University of Split, Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture
Place	Split
Date	06.10.2010.
INFORMATION ON ADDITIONAL TR	AINING
Year	
Place	
Institution	
Field of training	
MOTHER TONGUE AND FOREIGN	LANGUAGES
Mother tongue	Croatian
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	English (5)
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	German (3)
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	
COMPETENCES FOR THE COURSE	
Earlier experience as course teacher of similar courses (name title of course, study programme where it is/was offered, and level of study programme)	1. Course name: Artificial Intelligence Name of the study programme in which the course is offered: Automation and Systems, Electrical Engineering, Computer Engineering, Telecommunications and Computer Science, Computer Science The level of the study programme: Graduate study 2. Course name: Intelligent Systems

	Name of the study programme in which the subject is taught:
	Electrical Engineering and Information Technology
	The level of the study programme: Postgraduate study
	3. Course name: web intelligence and large data sets
	Name of the study programme in which the subject is taught:
	Electrical Engineering and Information Technology
	I ne level of the study programme: Postgraduate study
	1) Stipanicev Darko, Seric Ljiljana. Artificial intelligence. Split,
Authorship of university/faculty	FESB - Internal script, 2012.
textbooks in the field of the course	2) Bodrozic Lilijana. Programming languages of artificial
	Intelligence. Split, FESB - Internal script, 2007.
	1) Doko Alen, Stula Maja, Seric Ljiljana. Improved sentence
	recessing 8 management 40 (2012) 6 1201 1212
	processing & management, 49 (2013), 6, 1301-1312.
	2) Senc Ljiljana, Supanicev Darko, Siula Maja. Engineering of
	communications, 26 (2012), 2: 202 216
	2) Šorić Liiliona, Kretinić Damir, Brazvić Maia, Milatić Ivan;
	S) Sene Ljiljana, Kisunic Danni, Diabvić Maja, Milauć Ivan, Mirčovski Alioča, Stinaničov Darka, Holonic Multi Agont Svetom
	for Data Eusion in Vehicle Classification. Proceedings of 10th
	International KES Conference on Agents and Multi-Agent
Professional scholarly and artistic	Systems: Technologies and Applications (KES-AMSTA-16)
articles published in the last five	
vears in the field of the course (5	4) Stipaničev Darko, Šerić Liiliana, Krstinić Damir, Bugarić
works at most)	Marin Wildfire video observers network with physical and
works at mostly	virtual sensors. Proceeding of 10th FARSel. Forest Fire
	Special Interest Group Workshop - Sensors Multi-Sensor
	Integration Jarge Volumes: New opportunities and Challanges
	in Forest Fire Research Themistocleous Kyriacos
	Hadiimitsis, Diofantos: Gitas, Ioannios ; Boschetti, Luigi (ur.).
	Limassol. Cvprus. 2015.
	5) Ukić Nenad, Maras Josip, Šerić Liiliana.
	The influence of cyclomatic complexity distribution on the
	understandability of xtUML models, Software quality journal,
	PP (2016)
Professional and scholarly articles	
published in the last five years in	
subjects of teaching methodology	
and teaching quality (5 works at	
most)	
	AgiSeco – Agent Oriented Intelligent Systems for Environement
Professional, science and artistic	Monitoring and Control, MZOS, 2007-2012
projects in the field of the course	HOLISTIC – Adriatic Holistic Forest Fire Protection, IPA, 2014-
carried out in the last five years (5	in progres
at most)	Wind Risk Prevention Projekt – ECHO, Civil Protection
	Automatic vehicle classification based on computer vision and
The name of the new second	data tusion
the value of the programme and	
the volume in which the main	
the methodological psychological	
didactic-pedagogical group of	
competences	
PRIZES AND AWARDS, STUDENT	EVALUATION
scholarly/artistic work	20 best junior reasearchers, 2013
Results of student evaluation taken in	the last five years for the course
that is comparable to the course desc	cribed in the form (evaluation
organizer, average grade, note on gra	ading scale and course evaluated)

First and last name and title of teacher	Silvestar Šesnić, Ph.D., Assistant Professor	
The course he/she teaches in the proposed study programme	Fundamentals of Electrical Engineering 2	
GENERAL INFORMATION ON COL	IRSE TEACHER	
Address	Steninčeva 65. 21000 Split	
Telephone number	+38501/30581/	
E mail addross	±303914303014	
Porconal web page	SSESIIIC@IESD.III	
Vear of birth	1070	
Scientist ID	272065	
Research or art rank, and date of last rank appointment	Research associate, 14.02.2013.	
Research-and-teaching, art-and- teaching or teaching rank, and date of last rank appointment	Assistant Professor, 06.2014.	
Area and field of election into research or art rank	Technical sciences, Electrical engineering	
INFORMATION ON CURRENT EMP	PLOYMENT	
Institution where employed	Faculty of electrical Engineering, Mechanical Engineering and Naval Architecture, University of Split	
Date of employment	01.01.2005.	
Name of position (professor,		
researcher, associate teacher, etc.)	Assistant Professor	
Field of research	Electromagnetic theory	
Function	-	
INFORMATION ON EDUCATION -	Highest degree earned	
INFORMATION ON EDUCATION – Degree	Highest degree earned PhD	
INFORMATION ON EDUCATION – Degree Institution	Highest degree earned PhD Faculty of electrical Engineering, Mechanical Engineering and Naval Architecture, University of Split	
INFORMATION ON EDUCATION – Degree Institution Place	Highest degree earned PhD Faculty of electrical Engineering, Mechanical Engineering and Naval Architecture, University of Split Split, Croatia	
INFORMATION ON EDUCATION – Degree Institution Place Date	Highest degree earned         PhD         Faculty of electrical Engineering, Mechanical Engineering and         Naval Architecture, University of Split         Split, Croatia         04.11.2010.	
INFORMATION ON EDUCATION – Degree Institution Place Date INFORMATION ON ADDITIONAL T	Highest degree earned PhD Faculty of electrical Engineering, Mechanical Engineering and Naval Architecture, University of Split Split, Croatia 04.11.2010. RAINING	
INFORMATION ON EDUCATION – Degree Institution Place Date INFORMATION ON ADDITIONAL T Year	Highest degree earned PhD Faculty of electrical Engineering, Mechanical Engineering and Naval Architecture, University of Split Split, Croatia 04.11.2010. RAINING 2013	
INFORMATION ON EDUCATION – Degree Institution Place Date INFORMATION ON ADDITIONAL T Year Place	Highest degree earned PhD Faculty of electrical Engineering, Mechanical Engineering and Naval Architecture, University of Split Split, Croatia 04.11.2010. RAINING 2013. Clermont Ferrand, France	
INFORMATION ON EDUCATION – Degree Institution Place Date INFORMATION ON ADDITIONAL T Year Place Institution	Highest degree earned         PhD         Faculty of electrical Engineering, Mechanical Engineering and         Naval Architecture, University of Split         Split, Croatia         04.11.2010.         RAINING         2013.         Clermont Ferrand, France         Polytech' Clermont Ferrand, Blaise Pascal University	
INFORMATION ON EDUCATION – Degree Institution Place Date INFORMATION ON ADDITIONAL T Year Place Institution Field of training	Highest degree earned         PhD         Faculty of electrical Engineering, Mechanical Engineering and         Naval Architecture, University of Split         Split, Croatia         04.11.2010.         RAINING         2013.         Clermont Ferrand, France         Polytech' Clermont Ferrand, Blaise Pascal University         Electromagnetic compatibility	
INFORMATION ON EDUCATION – Degree Institution Place Date INFORMATION ON ADDITIONAL T Year Place Institution Field of training	Highest degree earned         PhD         Faculty of electrical Engineering, Mechanical Engineering and         Naval Architecture, University of Split         Split, Croatia         04.11.2010.         RAINING         2013.         Clermont Ferrand, France         Polytech' Clermont Ferrand, Blaise Pascal University         Electromagnetic compatibility	
INFORMATION ON EDUCATION – Degree Institution Place Date INFORMATION ON ADDITIONAL T Year Place Institution Field of training MOTHER TONGUE AND FOREIGN	Highest degree earned         PhD         Faculty of electrical Engineering, Mechanical Engineering and         Naval Architecture, University of Split         Split, Croatia         04.11.2010.         RAINING         2013.         Clermont Ferrand, France         Polytech' Clermont Ferrand, Blaise Pascal University         Electromagnetic compatibility         LANGUAGES	
INFORMATION ON EDUCATION – Degree Institution Place Date INFORMATION ON ADDITIONAL T Year Place Institution Field of training MOTHER TONGUE AND FOREIGN Mother tongue Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	Highest degree earned         PhD         Faculty of electrical Engineering, Mechanical Engineering and         Naval Architecture, University of Split         Split, Croatia         04.11.2010.         RAINING         2013.         Clermont Ferrand, France         Polytech' Clermont Ferrand, Blaise Pascal University         Electromagnetic compatibility         LANGUAGES         Croatian         English, 5	
INFORMATION ON EDUCATION – Degree Institution Place Date INFORMATION ON ADDITIONAL T Year Place Institution Field of training MOTHER TONGUE AND FOREIGN Mother tongue Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent) Foreign language on a scale from 2 (sufficient) to 5 (excellent)	Highest degree earned         PhD         Faculty of electrical Engineering, Mechanical Engineering and         Naval Architecture, University of Split         Split, Croatia         04.11.2010.         RAINING         2013.         Clermont Ferrand, France         Polytech' Clermont Ferrand, Blaise Pascal University         Electromagnetic compatibility         LANGUAGES         Croatian         English, 5         German, 2	
INFORMATION ON EDUCATION – Degree Institution Place Date INFORMATION ON ADDITIONAL T Year Place Institution Field of training MOTHER TONGUE AND FOREIGN Mother tongue Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent) Foreign language on a scale from 2 (sufficient) to 5 (excellent)	Highest degree earned         PhD         Faculty of electrical Engineering, Mechanical Engineering and         Naval Architecture, University of Split         Split, Croatia         04.11.2010.         RAINING         2013.         Clermont Ferrand, France         Polytech' Clermont Ferrand, Blaise Pascal University         Electromagnetic compatibility         LANGUAGES         Croatian         English, 5         German, 2	
INFORMATION ON EDUCATION – Degree Institution Place Date INFORMATION ON ADDITIONAL T Year Place Institution Field of training MOTHER TONGUE AND FOREIGN Mother tongue Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent) Foreign language on a scale from 2 (sufficient) to 5 (excellent) Foreign language on a scale from 2 (sufficient) to 5 (excellent) Foreign language on a scale from 2 (sufficient) to 5 (excellent) COMPETENCES FOR THE COURS Earlier experience as course teacher of similar courses (name title of course, study programme where it is/was offered, and level of study programme) Authorship of university/faculty	Highest degree earned PhD Faculty of electrical Engineering, Mechanical Engineering and Naval Architecture, University of Split Split, Croatia 04.11.2010. RAINING 2013. Clermont Ferrand, France Polytech' Clermont Ferrand, Blaise Pascal University Electromagnetic compatibility LANGUAGES Croatian English, 5 German, 2 -	

Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)	<ul> <li>Poljak, Dragan; Šesnić, Silvestar; Drissi, Khalil El- Khamlichi; Kerroum, Kamal; Tkachenko, Sergey. Transient Electromagnetic Field Coupling to Buried Thin Wire Configurations: Antenna Model versus Transmission Line Approach in the Time Domain. // International Journal of Antennas and Propagation. 2016 (2016); 1-11</li> <li>Šesnić, Silvestar; Garma, Tonko; Poljak, Dragan; Tkachenko, Sergey V. Comparison of the antenna model and experimental analysis of an impulse impedance of the horizontal grounding electrode. // Electric power systems research. 125 (2015); 159-163</li> <li>Garma, Tonko; Šesnić, Silvestar. Measurement and modeling of the propagation of the Ripple Control Signal through the distribution network. // International journal of electrical power &amp; energy systems. 63 (2014); 674-680</li> <li>Šesnić, Silvestar; Poljak, Dragan. Antenna model of the horizontal grounding electrode for transient impedance calculation: Analytical versus Boundary Element Method. // Engineering analysis with boundary elements. 37 (2013), 6; 909-913</li> <li>Šesnić, Silvestar; Poljak, Dragan; Tkachenko, Sergey V. Analytical Modeling of a Transient Current Flowing Along the Horizontal Grounding Electrode. // IEEE transactions on electromagnetic compatibility. 55 (2013), 6; 1132-1139</li> </ul>
Professional and scholarly articles published in the last five years in subjects of teaching methodology and teaching quality (5 works at most)	-
Professional, science and artistic projects in the field of the course carried out in the last five years (5 at most)	<ul> <li>ITER Physics Work Package – Code Development for Integrated Modelling, EURATOM, Horizon 2020</li> <li>Civil Engineering Applications of Ground Penetrating Radar, COST</li> <li>EMI study of PLC services, Bilateral agreement Cogito, Croatia, France</li> <li>Modelling and environmental aspects of ELF electromagnetic fields, MZOŠ</li> </ul>
The name of the programme and the volume in which the main teacher passed exams in/acquired the methodological-psychological- didactic-pedagogical group of competences?	-
PRIZES AND AWARDS, STUDENT	EVALUATION
Prizes and awards for teaching and scholarly/artistic work	-
Results of student evaluation taken in the last five years for the course that is comparable to the course described in the form (evaluation organizer, average grade, note on grading scale and course evaluated)	University of Split, 4.3, Fundamentals of Electrical Engineering 2

First and last name and title of teacher	Marija Šiško Kuliš, Ph.D., Associate Professor
The course he/she teaches in the proposed study programme	Introduction to Entrepreneurship
GENERAL INFORMATION ON COL	IRSE TEACHER
Address	llijin potok 16. 21210 Solin
Telephone number	098 414 732
E-mail address	marija.sisko-kulis@hep.hr
Personal web page	
Year of birth	1966.
Scientist ID	217703
Research or art rank, and date of	
last rank appointment	
Research-and-teaching, art-and-	
teaching or teaching rank, and	Associate Professor, May2011.
date of last rank appointment	
Area and field of election into	Technical sciences, mechanical engineering
research or art rank	
INFORMATION ON CURRENT EMP	PLOYMENT
Institution where employed	HEP Proizvodnja d.o.o., vanjski suradnik na Fakultetu strojarstva i brodogradnje u Splitu.
Date of employment	1.rujna 1994.
Name of position (professor,	
researcher, associate teacher,	Head of mechanical department at Hydro South
etc.)	
Field of research	Mechanical engineering, investment projects
Function	The manager and supervising engineer
INFORMATION ON EDUCATION –	Highest degree earned
Degree	PHD
Institution	Faculty of Mechanical Engineering and Naval Architecture, Zagreb
Place	Zagreb.
Date	21.09.2000.
INFORMATION ON ADDITIONAL T	RAINING
Year	1998/1999; 1995-1997
Place	LJubljana
Institution	Turboinštitut
Field of training	Water turbine_management of project reconstruction of
- · · · · · · · · · · · · · · · · · · ·	hydroelectric power plants
MOTHER TONGUE AND FOREIGN	LANGUAGES
Mother tongue	Hrvatski
Foreign language and command of	Engleski – 4
foreign language on a scale from 2	
(sufficient) to 5 (excellent)	
foreign language on a scale from 2	Niemački - 3
(sufficient) to 5 (excellent)	Njemački - S
Foreign language and command of	
foreign language on a scale from 2	
(sufficient) to 5 (excellent)	
COMPETENCES FOR THE COURS	E
Earlier experience as course	<ul> <li>Entrepreneurship, Professional Study of Mechanical</li> </ul>
teacher of similar courses (name	Engineering, Electrical Engineering, University of Split.
title of course, study programme	Department of Professional Studies,
where it is/was offered, and level	<ul> <li>Entrepreneurship in the media, professional study, TV</li> </ul>
of study programme)	Academy, Split.

	<ul> <li>Assessment of technological project- Graduate Studies, Industrial Engineering, FESB, Split.</li> </ul>
Authorship of university/faculty textbooks in the field of the course	
Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)	<ul> <li>Šiško Kuliš, M. (2013.): Ispitivanje osposobljenosti menadžmeta za primjenu alata i tehnika upravljanja kvalitetom u tvrtkama elektro i metaloprerađivačke industrije Hrvatske, Zbornik radova, Međunarodna konferencije, Neum 2013.</li> <li>Pleština, M, Šiško Kuliš, M. Vučina, D. (2013.): Analysis of investments in mall hydropower plants International Conference MTSM 2010 / Prof.dr. Dražen Živković (ur.). Split : Hrvatsko društvo za strojarske tehnologije, Hrvatska ; c/o FESB, 2013.</li> </ul>
Professional and scholarly articles published in the last five years in subjects of teaching methodology and teaching quality (5 works at most)	
Professional, science and artistic projects in the field of the course carried out in the last five years (5 at most)	Refurbishment of Zakucac HPP
The name of the programme and the volume in which the main teacher passed exams in/acquired the methodological-psychological- didactic-pedagogical group of competences?-pedagoške kompetencije?	
PRIZES AND AWARDS, STUDENT EVALUATION	
Prizes and awards for teaching and scholarly/artistic work	
Results of student evaluation taken in the last five years for the course that is comparable to the course described in the form (evaluation organizer, average grade, note on grading scale and course evaluated)	Average value 4.8

First and last name and title of teacher	Petar Šolić, Ph.D., Assistant Professor
The course he/she teaches in the proposed study programme	Signals and Systems
GENERAL INFORMATION ON COL	IRSE TEACHER
Address	Kupreška 14. 21000 Split. HR
Telephone number	+385981752651
E-mail address	psolic@fesb.hr
Personal web page	marjan.fesb.hr/~psolic
Year of birth	1985
Scientist ID	313610
Research or art rank, and date of	Desserve approviate 20.07.2015
last rank appointment	Research associate, 20.07.2015.
Research-and-teaching, art-and-	
teaching or teaching rank, and	Assistant professor, 01/10/2015
date of last rank appointment	
Area and field of election into	Technical Sciences.
research or art rank	
INFORMATION ON CURRENT EMP	PLOYMENT
Institution where employed	Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture
Date of employment	01/04/2009
Name of position (professor,	
researcher, associate teacher,	Assistant professor
etc.)	
Field of research	Telecommunications
Function	
INFORMATION ON EDUCATION –	Highest degree earned
Degree	PhD
Institution	Faculty of Electrical Engineering, Mechanical Engineering and
	Naval Architecture
Place	Split
Date	04/06/2014
INFORMATION ON ADDITIONAL T	RAINING
Year	
Place	
Institution	
Field of training	
MOTHER TONGUE AND FOREIGN	LANGUAGES
Mother tongue	Croatian
Foreign language and command of	
foreign language on a scale from 2	English (4)
(sufficient) to 5 (excellent)	
Foreign language and command of	
foreign language on a scale from 2	German (2)
(sunicient) to 5 (excellent)	
foreign language on a scale from 2	
(sufficient) to 5 (excellent)	
Earlier experiences FOR THE COURS	
Earlier experience as course	
title of course study programme	
where it is/was offered and level	
of study programme)	

Authorship of university/faculty	
Professional, scholarly and artistic	
articles published in the last five	
vears in the field of the course (5	
works at most)	
Professional and scholarly articles	
published in the last five years in	
subjects of teaching methodology	
and teaching guality (5 works at	
most)	
Professional, science and artistic	
projects in the field of the course	
carried out in the last five years (5	
at most)	
The name of the programme and	
the volume in which the main	
teacher passed exams in/acquired	
the methodological-psychological-	
didactic-pedagogical group of	
competences?-pedagoške	
kompetencije?	
PRIZES AND AWARDS, STUDENT	EVALUATION
Prizes and awards for teaching	National award for science in 2015 (scientific novice category)
and scholarly/artistic work	Scientific novice award in 2014 (doctorand/postdoc category)
Results of student evaluation taken	
in the last five years for the course	
that is comparable to the course	
described in the form (evaluation	
organizer, average grade, note on	
grading scale and course	
evaluated)	

First and last name and title of teacher	Božo Terzić, Ph.D., Full Professor	
The course he/she teaches in the proposed study programme	Maintenance and Testing of Electrical Power Equipment	
GENERAL INFORMATION ON COL	RSE TEACHER	
Address	Elemova 5, 21312 Podstrana HR	
Telephone number	+385.91.4305609	
E-mail address	bterzic@fesb.hr	
Personal web page		
Year of hirth	1962	
Scientist ID	138865	
Research or art rank, and date of	100000	
last rank appointment	Scientific Adviser, 9/7/2009	
Research and teaching art and		
teaching or teaching rank and	Senior Full Professor 18/9/2014	
date of last rank appointment		
Area and field of election into		
research or art rank	Technical Sciences, Field Electrical Engineering	
	Eaculty of Electrical Engineering Mechanical Engineering and	
Institution where employed	Naval Architecture	
Data of omployment		
Date of employment	1986.	
Name of position (professor,	Destance	
researcher, associate teacher,	Protessor	
etc.)		
Field of research	Electrical Drives, Power Converters	
Function	Head of Chair of Electrical Drives and Automation	
INFORMATION ON EDUCATION –	Highest degree earned	
Degree	PhD	
Institution	Faculty of Electrical Engineering, Mechanical Engineering and	
	Naval Architecture	
Place	Split	
Date	25/11/1998	
INFORMATION ON ADDITIONAL TI	RAINING	
Year		
Place		
Institution		
Field of training		
MOTHER TONGUE AND FOREIGN	LANGUAGES	
Mother tongue	Croatian	
Foreign language and command of		
foreign language on a scale from 2	English (4)	
(sufficient) to 5 (excellent)		
Foreign language and command of		
foreign language on a scale from 2	German (2)	
(sufficient) to 5 (excellent)		
COMPETENCES FOR THE COURSE		
Earlier experience as course	Electrical drives - Professional study programme of Electrical	
teacher of similar courses (name	engineering	
title of course, study programme	Testing of Electrical Equinement - Graduate study programme	
where it is/was offered, and level	of Power engineering	
of study programme)		
Authorship of university/faculty		
textbooks in the field of the course		
Professional, scholarly and artistic	1 Terzić Božo Despalatović Marin Slutej Aloiz	
articles published in the last five	Magnetization Curve Identification of Vector-Controlled	
years in the field of the course (5	Induction Motor at Low-Load Conditions // Automatika -	
works at most)		

	<ul> <li>Journal for Control, Measurement, Electronics, Computing and Communications, 53 (2012), 3; 1-8.</li> <li>Jadrić, Martin; Terzić, Božo; Despalatović, Marin; Majić, Goran; Slutej, Alojz; Šimić, Toni. Identification of Rotor Resistance and Transient Inductance of Induction Motors Using Frequency Selection Criterion // Proceedings of the 2012 XXth International Conference on Electrical Machines / Nogueiras Meléndez, Andrés A. (ur.). Marseille, Francuska : IEEE IES, 2012. 978-984.</li> <li>Terzić, Božo; Despalatović, Marin: Ispitivanje i procjena stanja izolacijskog sustava visokonaponskih motora u tvornicama cementa CEMEX – Kaštel Sućurac, tijekom posljednjih 5 godina svake godine se testira približno 30 visokonaponskih motora, Naručitelj: Cemex, 20122016.</li> <li>Terzić, Božo; Despalatović, Marin; Majić, Goran; Gladina, Željko: Mjerenja i analiza karakteristika upuštača asinkronih motora u postrojenju mlina cementa 2 u tvornici Cemex – Pogon Sv. Juraj, Naručitelj: Siemens, 2014.</li> <li>Terzić, Božo; Despalatović, Marin; Majić, Goran; Stergulc, Marjan; Kriletić, Ante; Šormaz, Krste: Frequency Converter Design for High Speed Permanent Magnet Generator in Cogeneration Plants,, Technical Journal, Scientific- professional Journal of University North, Vol. 10, No. 3-4, Croatia, 2016.</li> </ul>
Professional and scholarly articles published in the last five years in subjects of teaching methodology and teaching quality (5 works at most)	
Professional, science and artistic projects in the field of the course carried out in the last five years (5 at most)	<ol> <li>Domestic sceintific project: On-line parameter identification of synchronous generator, project leader, 2011. – 2013., funding the project: MZOŠ</li> <li>International development project: Development of electric drives for crane systems operating in hard environment, project leader, 2008. – 2013., in cooperation with swedish company ABB Crane Systems that fully funded the project.</li> <li>Researche and development project: A safer and more efficient cogeneration / trigeneration plants, project leader, 20142016., project was funded from EU structural funds.</li> </ol>
The name of the programme and the volume in which the main teacher passed exams in/acquired the methodological-psychological- didactic-pedagogical group of competences?-pedagoške kompetencije?	
PRIZES AND AWARDS, STUDENT	EVALUATION
Prizes and awards for teaching	
Results of student evaluation taken in the last five years for the course that is comparable to the course described in the form (evaluation organizer, average grade, note on grading scale and course evaluated)	From 4 to 4,8.

First and last name and title of teacher	Slavko Vujević, Ph.D., Full Professor
The course he/she teaches in the proposed study programme	Marine Electrical Engineering
GENERAL INFORMATION ON COU	RSE TEACHER
Address	Vijugasta 18, Hr-21000 Split, Croatia
Telephone number	+385 21 305-613
E-mail address	vujevic@fesb.hr
Personal web page	
Year of birth	1958
Scientist ID	122731
Research or art rank, and date of last rank appointment	Scientific Adviser; January 20, 2005
Research-and-teaching, art-and- teaching or teaching rank, and date of last rank appointment	Senior Full Professor, September 24, 2009
Area and field of election into research or art rank	Technical Sciences, Electrical Engineering
INFORMATION ON CURRENT EMP	LOYMENT
Institution where employed	Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture
Date of employment	February 26, 1982
Name of position (professor,	Drefessor
researcher, associate teacher, etc.)	
Field of research	Electrical Measurement, Power Quality
Function	Head of the Subdepartment of Electromagnetics and Engineering Modeling
INFORMATION ON EDUCATION - H	lighest degree earned
Degree	Ph D
Institution	Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture
Place	Split
Date	July 14, 1994
INFORMATION ON ADDITIONAL TR	AINING
Year	2003
Place	Neumarkt, Germany
Institution	DEHN + Söhne
	Certificate in Red/Line-Seminar and Vellow/Line-Seminar on
Field of training	"Lightning and Surge Protection in Power Networks"
MOTHER TONGUE AND FOREIGN	LANGUAGES
Mother tongue	Croatian
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	English (4)
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	German (2)
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	
COMPETENCES FOR THE COURS	
Earlier experience as course teacher of similar courses (name title of course, study programme	<ul> <li>Electric Machinery Fundamentals, university undergraduate study of Electrical Engineering, University of Split, FESB</li> </ul>

where it is/was offered, and level of study programme)	<ul> <li>Fundamentals of Electric Power Engineering, the university undergraduate study of Electrical Engineering, specialisation Electronics, University of Split, FESB</li> <li>Marine Electrical Engineering, the university undergraduate study of Naval Architecture, University of Split, FESB</li> <li>Marine Electrical Engineering, the university undergraduate study of Electrical Engineering, the university undergraduate study of Electrical Engineering and Information Technology, University of Split, FESB</li> </ul>
Authorship of university/faculty textbooks in the field of the course	
Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)	<ol> <li>Vujević, Slavko; Lovrić, Dino, On Continuous Numerical Fourier Transform for Transient Analysis of Lightning Current Related Phenomena, Electric Power Systems Research, Vol. 119, pp. 364-369, 2015.</li> <li>Vujević, Slavko; Lovrić, Dino; Balaž, Zdenko, Self and Mutual Ground Impedances of Cylindrical Metal Plates Buried In Homogeneous Earth, International Journal of Numerical Modelling - Electronic Networks Devices and Fields; Vol. 28. No. 1, pp. 33-49, 2015.</li> <li>Vujević, Slavko; Lovrić, Dino; Boras, Vedran, High-Accurate Numerical Computation of Internal Impedance of Cylindrical Conductors for Complex Arguments of Arbitrary Magnitude, IEEE Transactions on Electromagnetic Compatibility, Vol. 56, No. 6, pp. 1431-1438, 2014.</li> <li>Lovrić, Dino; Vujević, Slavko; Modrić, Tonći, On the Estimation of Heidler Function Parameters for Reproduction of Various Standardized and Recorded Lightning Current Waveshapes, International Transactions on Electrical Energy Systems; Vol. 23, No. 2, pp. 290-300, 2013.</li> <li>Vujević, Slavko; Sarajčev, Petar; Lovrić, Dino, Time- Harmonic Analysis of Grounding System in Horizontally Stratified Multilayer Medium, Electric Power Systems Research, Vol. 83, No. 1, pp. 28-34, 2012.</li> </ol>
Professional and scholarly articles published in the last five years in subjects of teaching methodology and teaching quality (5 works at most)	
Professional, science and artistic projects in the field of the course carried out in the last five years (5 at most)	Project of MZOS of Republic of Croatia no. 023-0000000-3271 - Development of Advanced Algorithms for Modelling of Electromagnetic Phenomena, 2008 - 2013 (project leader Professor Slavko Vujević)
The name of the programme and the volume in which the main teacher passed exams in/acquired the methodological-psychological- didactic-pedagogical group of competences	
PRIZES AND AWARDS, STUDENT	EVALUATION
Prizes and awards for teaching and scholarly/artistic work	
Results of student evaluation taken in the last five years for the course that is comparable to the course described in the form (evaluation organizer, average grade, note on grading scale and course evaluated)	

First and last name and title of teacher	Dinko Vukadinović, Ph.D., Full Professor
The course he/she teaches in the	Power Electronics Electronic Converters for Power Supplies
GENERAL INFORMATION ON COL	
Address	Pujanke 61, Split
Telephone number	021/376-715
E-mail address	dvukad@fesb.hr
Personal web page	
Year of birth	1973
Scientist ID	248950
Research or art rank, and date of last rank appointment	Senior research scientist, 15/7/2010
Research-and-teaching, art-and- teaching or teaching rank, and date of last rank appointment	Full Professor, 26/1/2013
Area and field of election into research or art rank	Technical Sciences, Electrical engineering
INFORMATION ON CURRENT FM	PI OYMENT
Institution where employed	Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture
Date of employment	9/2/1998
Name of position (professor, researcher, associate teacher, etc.)	Full Professor
Field of research	Power Engineering (Power Electronics, Control of Electrical Machines)
Function	Head of Group for Power Electronics and Control
INFORMATION ON EDUCATION -	Highest degree earned
Degree	PhD
Institution	Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture
Place	Split
Date	27/10/2005
	RAINING
Yoor	
Place	
Field of training	
MOTHER TONGUE AND FOREIGN	LANGUAGES
Mother tongue	Croatian
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	English, 3
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	Germany, 2
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	
COMPETENCES FOR THE COURS	SE

Earlier experience as course teacher of similar courses (name title of course, study programme where it is/was offered, and level	Power Electronics, Undergraduate study programme Electronic Converters for Power Supplies, Undergraduate study programme
of study programme)	
Authorship of university/faculty	
Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)	<ol> <li>Bašić, M., Vukadinović, D. "Online Efficiency Optimization of a Vector Controlled Self-Excited Induction Generator", IEEE Transactions on Energy Conversion. 31 (2016), 1; 373-380</li> <li>Vukadinović, D., Bašić, M., Nguyen, C.H., Vu, N.L., Nguyen, T.D., "Hedge-Algebra-Based Voltage Controller for a Self- Excited Induction Generator", <i>Control</i> <i>engineering practice</i>, 30 (2014); 78-90</li> <li>Bašić, M., Vukadinović, D., "Vector control system of a self- excited induction generator including iron losses and magnetic saturation", <i>Control engineering practice</i>, 21 (2013), 4; 395-406</li> <li>Bašić, M., Vukadinović, D., Petrović, G., "Dynamic and Pole-Zero Analysis of Self-Excited Induction Generator Using a Novel Model with Iron Losses", <i>International journal of electrical power &amp; energy systems</i>, 42 (2012), 1; 105-118</li> <li>Bašić, M., Vukadinović, D., Polić, M., "Analysis of Power Converter Losses in Vector Control System of a Self- Excited Induction Generator", <i>Journal of Electrical Engineering - Elektrotechnický časopis</i>, 65 (2014), 2; 65- 74</li> </ol>
Professional and scholarly articles published in the last five years in subjects of teaching methodology	
and teaching quality (5 works at	
Professional, science and artistic	
projects in the field of the course	
carried out in the last five years (5 at most)	
The name of the programme and the volume in which the main teacher passed exams in/acquired the methodological-psychological- didactic-pedagogical group of competences?-pedagoške kompetencije?	
PRIZES AND AWARDS. STUDENT EVALUATION	
Prizes and awards for teaching	
and scholarly/artistic work	
in the last five years for the course	
that is comparable to the course	
described in the form (evaluation	
grading scale and course evaluated)	
## 3.4. Optimal number of students

The admission quote for the first year of studies is 30.

## 3.5. Estimate of costs per student

Annual costs of studies per student amount to HRK 25,000.00.

## 3.6. Plan of procedures of study programme quality assurance

In keeping with the European standards and guidelines for internal quality assurance in higher education institutions (according to "Standards and Guidelines of Quality Assurance in the European Higher Education Area") on the basis of which the University of Split defines procedures for quality assurance, the proposer of the study programme is obliged to draw up a plan of procedures of study programme quality assurance.

Documentation on which the quality assurance system of the constituent part of the University is based:

- Regulations on the quality enhancement system of FESB
- Quality Assurance Handbook of the constituent part

Description of procedures for evaluation of the quality of study programme implementation:

- For each procedure the method needs to be described (most often questionnaires for students or teachers, and self-evaluation questionnaire), name the body conducting evaluation (constituent part, university office), method of processing results and making information available, and timeframe for carrying out evaluation
- If procedure is described in an attached document, name the document and the article.

Evaluation of the work of teachers and part-time teachers	<ul> <li>Student evaluation of quality of instruction and teaching activities conducted through student survey (printed questionnaires)</li> <li>Survey is organised and conducted by the Quality Enhancement Committee of the Faculty (Committee)</li> <li>Survey results are processed automatically at the University</li> <li>Survey is conducted each semester</li> <li>The Committee presents cumulative results of the survey at the sessions of the Faculty Council. The report is published at the Faculty web site.</li> <li>All procedures are conducted in accordance with the Regulations on organisation and role of the quality assurance system of the University of Split, Regulations on procedure of student evaluation of the quality of teachers and teaching of the University of Split and Regulations on the quality enhancement system of FESB.</li> </ul>
Monitoring of grading and harmonization of grading with anticipated learning outcomes	Committee for study programmes in Electrical Engineering and Computing is monitoring the harmonisation of grading and learning outcomes. All the procedures are conducted in accordance with the Rules of procedure of the Faculty Council and the Rules of

	procedure of the Department, since the Committees for study programmes are bodies of the Faculty Council and are accountable to the Faculty Council.
Evaluation of availability of resources (spatial, human, IT) in the process of learning and instruction	<ul> <li>Student evaluation of work performance of administrative and supporting services, learning infrastructure and student life is conducted through e-survey</li> <li>Evaluation is conducted using an on-line questionnaire which the students complete in each year of study, except the final year</li> <li>Survey is organised by the Quality Enhancement Centre of the University of Split, and is implemented by the Quality Enhancement Committee)</li> <li>Survey results are processed automatically at the University</li> <li>Survey results are presented at the Faculty Council sessions and published at the Faculty web site.</li> </ul>
Availability and evaluation of student support (mentorship, tutorship, advising)	<ul> <li>Administrative and supporting services are available to students to provide support in their study activities</li> <li>Supervisors/ mentors are appointed for students' final papers and diploma thesis</li> </ul>
Monitoring of student pass/fail rate by course and study programme as a whole	<ul> <li>Analysis of student pass rate by courses and study programmes is carried out once a year</li> <li>Analysis of pass rate by study programmes is carried out by the University in cooperation with the Committee</li> <li>Analysis by courses and study programmes is carried out by the Faculty Management Board</li> <li>Results of both analyses are presented at the Faculty Council sessions and published at the Faculty web site.</li> </ul>
Student satisfaction with the programme as a whole	<ul> <li>Student evaluation of work performance of administrative and supporting services, learning infrastructure and student life is conducted through e-survey</li> <li>Evaluation is conducted using an on-line questionnaire which the students complete following the completion of studies</li> <li>Survey is organised by the Quality Enhancement Centre of the University of Split, and is implemented by the Quality Enhancement Committee)</li> <li>Survey results are processed automatically at the University</li> <li>Survey results are presented at the Faculty Council sessions and published at the Faculty web site.</li> </ul>
Procedures for obtaining feedback from external parties (alums, employers, labour market and other relevant organizations)	<ul> <li>Once every month, the Faculty Management Board meets with the alumni representatives</li> <li>Once a year, during the annual FESB anniversary event, round tables and workshops are organised with representatives of employers and other stakeholders</li> </ul>
Evaluation of student practical education (where this applies)	Professional training is a mandatory course of the study programme. Head of the professional training from the receiving institution and the head of professional training from the Faculty are appointed for each student. During the training student writes Professional training report

	which describes working tasks covered by the professional training. Students are obliged to complete professional training in accordance with the Regulation on professional training. Professional training report is validated by the head of professional training from the receiving institution and the head of professional training from the Faculty. Professional training is not evaluated. In addition to the Professional training report student completes a Questionnaire on professional training that evaluates student's satisfaction with organization and performance of the professional training.
Other evaluation procedures carried out by the proposer	<ul> <li>Internal audit of the quality assurance system is conducted once every year</li> <li>Self-evaluation is carried out every 5 years</li> <li>All the procedures are conducted in line with the Quality Assurance Handbook of FESB.</li> </ul>
Description of procedures for informing external parties on the study programme (students, employers, alums)	<ul> <li>All information are available through the Faculty web site: <u>https://www.fesb.hr</u></li> <li>Visits to the faculty are organised for high-school students from Split and the wider region</li> <li>Participation at University fairs</li> <li>Public media presentations</li> </ul>