UNIVERSITY OF SPLIT

FACULTY OF ELECTRICAL ENGINEERING, MECHANICAL ENGINEERING AND NAVAL ARCHITECTURE

DETAILED PROPOSAL OF THE STUDY PROGRAMME

UNDERGRADUATE VOCATIONAL STUDY IN COMPUTING

SPLIT, June 2017

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GENERAL INFORMATION OF HIGHER EDUCATION INSTITUTION

Name of higher education institution	FACULTY OF ELECTRICAL ENGINEERING, MECHANICAL ENGINEERING AND NAVAL ARCHITECTURE
Address	Ulica Ruđera Boškovića 32
Phone	021 305 777
Fax	021 305 776
E.mail	dekanat@fesb.hr
Internet address	htpp://www.fesb.hr

GENERAL INFORMATION OF THE STUDY PROGRAMME

Name of the study programme	Computing		
Provider of the study programme	FACULTY OF ELECTRICAL ENGINEERING, MECHANICAL ENGINEERING AND NAVAL ARCHITECTURE		
Other participants			
Type of study programme	Vocational study programme ☒	University study programme ☐	
Level of study programme	Undergraduate ☒	Graduate ☐	Integrated ☐
	Postgraduate ☐	Postgraduate specialist ☐	Graduate specialist ☐
Academic/vocational title earned at completion of study	Vocational Bachelor of Computing		

1. INTRODUCTION

1.1. Reasons for starting the study programme

Computing is a field of science and engineering which encompasses, in a wider sense, the study and use of information, specifically the processes of design, implementation and modification of structures used for information exchange, filing and processing. At the present time, computing is interrelated with a large number of areas of human activity. The fundamental concepts are very similar, whether they concern hardware or software systems, or natural and social systems. Accordingly, the demand for experts in the field of computing is very high, and covers the needs for professional use of ready-made solutions, design, application and use of highly complex systems and producing original scientific papers in the area of computing and interdisciplinary areas linked with computing.

The current demands of the economy are primarily reflected in the constant demand for and permanent lack of experts in the field of computing. The prevailing trends indicate that the demand for this profile of experts will further increase. Necessary requirement for reaching the goals defined in the "Croatian Development Strategy in the 21st Century" is sufficient number of highly educated experts in the field of computing.

In the previous time period, computing strongly influenced the development of science, engineering, business management and other areas of human activity. These days nearly every person uses a computer for some of their activities, and many students want to study at least some forms of computing. Computing shall still be present in forming the careers of a large number of experts, and those who choose computing as their professional career path will occupy a crucial role in forming the future society. Development of modern society necessitates that the study of computing attracts excellent students with variety of interests and prepares them to become capable and responsible experts.

The goal of the proposed study programme in Computing is to educate professional staff in the area of computing to meet the demands of the industry, higher education institutions, governmental and public institutions.

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

Split is the economic and university hub of the major part of the Dalmatian region, as well as one part of the neighbouring region of Bosnia and Herzegovina, and FESB is the only institution offering study programme in computing in the area. According to the labour market estimates for the area of ICT, during the following short-term period several thousand experts in the area of computing will be required in the Republic of

Croatia, and several hundred thousand similar experts in the area of the EU. These estimates are confirmed through regular contact with the companies in the wider area and prospects for this profile of experts are excellent. The fact is confirmed by data on interest of students in the study programme in computing at FESB-u, which is constantly growing and attracting students from various secondary school programmes.

Following the completion of studies, the acquired knowledge enables the students to find employment in the industrial sector, software and ICT companies, education, service industries, etc. There is virtually no working environment in which experts with completed vocational degree in Computing could not find employment and the labour market demand for this profile of experts is 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.

At the vocational study programme in Computing, students acquire competencies for work in various fields computing and information and communication technologies. Following the completion of studies, graduates acquire an appropriate level of knowledge and skills which enable them to perform professional tasks and become directly involved in the working processes in the field of computing.

1.3. Compatibility with requirements of professional organizations

In the process of development of the curriculum, best practice examples provided by the leading associations in the area of computing were taken into account (The Association for Computing - ACM, The Association for Information Systems - AIS, The Computer Society - IEEE-CS).

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, Education and Sports.

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 Computing, 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. Best practice examples from American universities were included, summarised in the document "Computing Curricula 2004" prepared by the leading professional associations in the area of computing (The Association for Computing - ACM, The Association for Information Systems - AIS, The Computer Society - IEEE-CS). The educational systems in the field of computing 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 engineering and information technology and specific specialist courses related to particular branches of computing. 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/). The proposal for the programme is consolidated with the recommendations of associations SEFI (European Society for Engineering Education) and CESAER (Conference of European Schools for Advanced Engineering Education and Research). The organisation of the proposed study programme is comparable with related study programmes at renowned European universities, e.g.:

- Techniche Univerzität Wien/ Engineering University Vienna, Austria
  http://www.tuwien.ac.at/informationen_fuer/studierende
- Eidgenössische Technische Hochschule (ETH)/ Swiss Federal Institute of Technology in Zürich, Switzerland
  https://www.ethz.ch/de/studium.html

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

Vocational study programme in Computing enables vertical and horizontal mobility of students. In terms of vertical mobility, the vocational study programme in Computing can primarily be followed by corresponding specialist vocational studies. In terms of horizontal mobility, the vocational study programme in Computing is open for mobility of students of related studies at all Croatian universities. Students have the

opportunity to complete a part of the study programme at a similar institution in Croatia or abroad.

Experts educated at the vocational study programme in Computing at FESB shall acquire a wide range of general knowledge which enables them to become engaged in various tasks related to design, implementation and use of computer systems. Therefore, the educational activities encourage mobility, providing the students with an opportunity to choose courses from other constituents of the University of Split, as well as courses from other higher education institutions in Croatia and abroad.

On the other hand, the demand for IT education is growing in all professions; consequently the study programme is open for students from other study programmes, who can acquire additional competences at the study programme in Computing.

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 Computing 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 Computing 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 computing 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 and 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. The Faculty has implemented professional studies (level VI in former qualifications system) since 1979 until today, with hiatus during the period 1998-2001. In 1985, at the university undergraduate study in Electrical Engineering the field of study in Computer Engineering was introduced and so far over 200 students completed this study programme.

Due to considerable demand for larger number of experts in this field, in 2001 comprehensive study programme in Computing was introduced at FESB. More than 700 students enrolled the programme, with over 190 students earning their degrees. In 2005, within the framework of the initial stage of the Bologna Process, the current curriculum for the vocational study programme in Computing was adopted. The curriculum was created on the basis of experiences gained in the implementation of the previous undergraduate vocational study programme, with application of basic determinants of the Bologna Process. The duration of the teaching activities during the study programme is five semesters (150 ECTS credits). The sixth semester of studies is provided for completion of the final thesis. The proposed vocational study programme in Computing is planned to replace the existing one.
Quality of education at FESB is confirmed by success and excellence of FESB graduates worldwide, including the highly developed countries. However, the most important is the fact that professionals trained at FESB represent a foundation of highly educated science and engineering labour force in the region.

2. DESCRIPTION OF THE STUDY PROGRAMME

2.1. General information

Scientific/artistic area of the study programme	Vocational studies - Computing
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 *Computing*. The learning outcomes are aligned with the Croatian Qualification Framework Act and are listed in the areas of knowledge, skills and related fields of independence and responsibility.

KNOWLEDGE

1. Apply appropriate mathematical, physical and engineering principles in solving practical problems in the area of computing.
2. Propose environment appropriate for given software requirements.
3. Apply appropriate methods in software development.
4. Consolidate theoretical knowledge and practical skills in problems in the area of computing.
5. Recognise the possibilities of applied algorithms, techniques and methods and their limitations.
6. Evaluate the influence of computer architecture on software solution.
7. Design creative solutions in the development, design, implementation and analysis of computer systems and computer networks.
8. Analyse code, predict behaviour, test the correctness of an algorithm or programme written in pseudocode or known programming language.

9. Develop, construct, design and write software using state-of-the-art web design technologies.
10. Design, maintenance and monitoring of computer systems which include integration of software and hardware solutions.
11. Design, modification and maintenance of computer network.

SKILLS

12. Apply the techniques, skills and advanced engineering tools necessary in the engineering work.
13. Maintenance of computer systems and computer infrastructure.
14. Apply the engineering knowledge and skills to effectively resolve the engineering problems, both independently and as a part of team.
15. Apply acquired programming knowledge in different programming environments and on different target platforms for implementing individually developed applications.
16. Prepare design documents and technical reports, using modern technologies.
17. Participate in the work of multidisciplinary and international teams.
18. To use the literature, databases and other sources of information.
19. Develop a business plan with all necessary technological, economic and financial parameters.
20. Give a public presentation, to prepare a written report and present project results in Croatian and English.

INDEPENDENCE

21. Manage projects in the area of computing, from the preparation stage to completion.
22. Adapt to new techniques and technologies.
23. Work in the field under unforeseen conditions.

RESPONSIBILITY

24. Demonstrate awareness of the influences of engineering practice on the individual, society and environment.
25. Demonstrate professional and ethical responsibility in unforeseen conditions.
26. Demonstrate awareness on health, safety and legal issues related to the individuals and social groups.
27. Recognise the need for participating in life-long learning and acquiring the knowledge about new technologies.

2.3. Employment possibilities

Following the completion of studies, the acquired knowledge enables the students to find employment in the companies in the sector of computer technology and system development, as well as companies which use computer technology as strong support to standard operating activities. Graduates may find employment in the industry, electric power industry, education, service industry, etc. There is virtually no

working environment in which experts with completed undergraduate vocational degree in Computing 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. At the undergraduate vocational study programme in Computing, students acquire practical computing skills such as web application development, computer architecture and computer network design.
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 Computing, 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 lower 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. 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

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	HOURS IN SEMESTER*					ECTS
			L	S	AE	LE	DE	
Mandatory	FEMY03	Mathematics	45	0	45	0	0	7
	FENP02	Electrical engineering	30	0	15	15	0	6
	FESP01	Introduction to computer science	30	0	0	30	0	5
	FELP21	Programming 1	60	0	0	45	0	10
	FEOP02	English language 1	0	30	0	0	0	2
	Total		165	30	90	75	0	30
	* L = lectures, S = seminars, AE = auditory excercise, LE = laboratory excercise, DE = design excercise							
	No elective courses							

List of courses								
Year of study: 1.								
Semester: II.								
STATUS	CODE	COURSE	HOURS IN SEMESTER*					ECTS
			L	S	AE	LE	DE	
Mandatory	FEMY02	Applied mathematics	30	0	30	0	0	5
	FELP02	Basic electronics	30	0	15	15	0	5
	FELO11	Digital techniques	45	0	30	15	0	7
	FELP03	Programming 2	60	0	30	30	0	10
	FEOP03	English language 2	0	30	0	0	0	3
	Total		165	30	90	75	0	30
	* L = lectures, S = seminars, AE = auditory excercise, LE = laboratory excercise, DE = design excercise							
	No elective courses							

List of courses								
Year of study: 2.								
Semester: III.								
STATUS	CODE	COURSE	HOURS IN SEMESTER*					ECTS
			L	S	AE	LE	DE	
Mandatory	FESY02	Introduction to entrepreneurship	30	0	15	0	0	4
	FELP04	Computer architectures	45	0	15	30	0	6
	FELP22	Databases	30	0	0	30	0	5
	FELP24	Algorithms and data structures	30	0	0	30	0	5
	FELP07	Programming in the unix environment	30	0	0	30	0	5
	FELP23	Internet programming	30	0	0	30	0	5
	Total		195	0	30	150	0	30
	* L = lectures, S = seminars, AE = auditory excercise, LE = laboratory excercise, DE = design excercise							
	No elective courses							

List of courses								
Year of study: 2.								
Semester: IV.								
STATUS	CODE	COURSE	HOURS IN SEMESTER*					ECTS
			L	S	AE	LE	DE	
Mandatory	FELP08	Computer networks	30	0	15	15	0	5
	FELP09	Operating systems	45	0	0	30	0	7
	FELP10	Object-oriented programming	45	0	0	30	0	7
	FELP11	Programming in Java	30	0	0	30	0	6
	FELP12	Multimedia networks and systems	30	0	0	30	0	5
	Total		180	0	15	135	0	30
	* L = lectures, S = seminars, AE = auditory excercise, LE = laboratory excercise, DE = design excercise							
	No elective courses							

List of courses								
Year of study: 3.								
Semester: V.								
STATUS	CODE	COURSE	HOURS IN SEMESTER*					ECTS
			L	S	AE	LE	DE	
Mandatory	FELP25	Software engineering	30	0	0	30	0	5
	FELP26	Introduction to distributed information systems	30	0	0	30	0	5
		Elective course 1**	30	0	0	30	0	5
		Elective course 2**	30	0	0	30	0	5
		Elective course 3**	30	0	0	30	0	5
		Elective course 4**	30	0	0	30	0	5
	Total		180	0	0	180	0	30
Elective**	FELP13	PC arhitecture	30	0	0	30	0	5
	FELP14	Windows programming	30	0	0	30	0	5
	FELP15	Databases 2	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
	FELP31	Advanced web technologies	30	0	0	30	0	5
	FETP01	Business Process Management	30	0	15	0	0	5
	Four elective course are selected.							
* L = lectures, S = seminars, AE = auditory excercise, LE = laboratory excercise, DE = design excercise								

List of courses								
Year of study: 3.								
Semester: VI.								
STATUS	CODE	COURSE	HOURS IN SEMESTER*					ECTS
			L	S	AE	LE	DE	
Mandatory	FELP27	System analysis and design	30	0	0	30	0	5
	FEYY03	Professional Training						10
		Elective course**	30	0	0	30	0	5
	FEYY01	Final thesis	0	0	0	0	0	10
	Total		30	0	0	30	0	30
Elective**	FELP20	Microcontroller guided mobile robots	30	0	0	30	0	5
	FELP19	Mobile communication networks	30	0	0	30	0	5
	FELP28	Introduction to 3D game programming	30	0	0	30	0	5
	FELP29	Programming for Android	30	0	0	30	0	5
	One elective course is selected.							
* L = lectures, S = seminars, AE = auditory excercise, LE = laboratory excercise, DE = design excercise								

2.13. Course description

<table>
<tr><td>NAME OF THE COURSE</td><td colspan="6">ALGORITHMS AND DATA STRUCTURES</td></tr>
<tr><td>Code</td><td>FELP24</td><td>Year of study</td><td colspan="5">2.</td></tr>
<tr><td>Course teacher</td><td>Linda Vicković, Ph.D., Associate Professor</td><td>Credits (ECTS)</td><td colspan="5">5</td></tr>
<tr><td rowspan="2">Associate teachers</td><td rowspan="2">Ivica Crnjac, Teaching Assistant</td><td rowspan="2">Type of instruction (number of hours)</td><td>L</td><td>S</td><td>AE</td><td>LE</td><td>DE</td></tr>
<tr><td>30</td><td>0</td><td>0</td><td>30</td><td></td></tr>
<tr><td>Status of the course</td><td>Obligatory</td><td>Percentage of application of e-learning</td><td colspan="5">0</td></tr>
<tr><td colspan="7">COURSE DESCRIPTION</td></tr>
<tr><td>Course objectives</td><td colspan="6">Training students for:
- understanding and appliance of basic algorithm analysis principles,
- permanent adoption and deepening of knowledge form the area of dynamic memory allocation, as well as management of abstract data types like stacks, queues and binary trees,
- understanding and appliance of simple and complex sorting algorithms.</td></tr>
<tr><td>Course enrolment requirements and entry competences required for the course</td><td colspan="6">Students have to pass Programming 1 from the first year of study.</td></tr>
<tr><td>Learning outcomes expected at the level of the course (4 to 10 learning outcomes)</td><td colspan="6">Students will be able to:
- define basic terms related to algorithm analysis,
- describe and perform adding, deleting, searching, of elements in single and double linked lists,
- create functions for adding and deleting of stack and queue elements,
- recognise appliance of abstract data types in problem solving,
- describe steps of adding, deleting and searching of elements in binary search trees,
- using basic AVL rotations to reach a balance condition,
- name and use different recursive searching algorithms.</td></tr>
<tr><td rowspan="16">Course content broken down in detail by weekly class schedule (syllabus)</td><td colspan="4">Course content</td><td>L or S hours</td><td>AE hours</td></tr>
<tr><td colspan="4">Introduction to the course. Review of basic elements of C programming language (recursive functions, data structures, pointers, dynamic memory allocation, file handling).</td><td>2</td><td></td></tr>
<tr><td colspan="4">Algorithm analyses mathematical background and running time calculation of algorithm.</td><td>2</td><td></td></tr>
<tr><td colspan="4">Abstract data types, simple implementation of linked lists and its basic operations.</td><td>2</td><td></td></tr>
<tr><td colspan="4">Linked lists sorting.</td><td>2</td><td></td></tr>
<tr><td colspan="4">Doubly linked lists, circularly linked lists.</td><td>2</td><td></td></tr>
<tr><td colspan="4">Stack and its applications (stack frames, balancing symbols), queue.</td><td>2</td><td></td></tr>
<tr><td colspan="4">Binary search trees and basic operations on binary search trees.</td><td>2</td><td></td></tr>
<tr><td colspan="4">AVL trees.</td><td>2</td><td></td></tr>
<tr><td colspan="4">Basic sorting methods.</td><td>2</td><td></td></tr>
<tr><td colspan="4">Shellsort i Quicksort.</td><td>2</td><td></td></tr>
<tr><td colspan="4">Mergesort.</td><td>2</td><td></td></tr>
<tr><td colspan="4">Heaps and Heapsort.</td><td>2</td><td></td></tr>
<tr><td colspan="4">Hashing.</td><td>2</td><td></td></tr>
</table>

	List of laboratory or design exercises	LE or DE hours
	Basic operations in the array of structures.	2
	Adding new element at the end and beginning of linked list as well as Printing and deleting elements.	2
	Adding new element behind and in front of the specified element in linked list. Sorting of elements in list, reading list elements from file and writing list elements in file.	2
	Using linked lists for polynomial adding and multiplying.	2
	Union and cross section of two linked lists.	2
	Stack and queue implementation of linked lists.	2
	Circular stack and priority queue implementation of linked lists.	2
	Using stack for postfix expression.	2
	Using simple sorting algorithms like exchange, selection, insertion and bubble sort for randomly generated numbers sorting.	2
	Using Shllsort, Quicksort and Mergesort for randomly generated numbers sorting.	2

Format of instruction	☒ lectures ☐ seminars and workshops ☐ exercises ☐ *on line* in entirety ☐ partial e-learning ☐ field work	☐ independent assignments ☒ multimedia ☒ laboratory ☐ work with mentor ☐ (other)
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	Research		Practical training	
	Experimental work		Report		Individual work	1,5
	Essay		Seminar essay		Laboratory exercises	1,5
	Tests	0,2	Oral exam		Preparation for laboratory exercises	0,7
	Written exam	0,1	Project		(Other)	

Grading and evaluating student work in class and at the final exam	There are two parts of the exam, theoretical and laboratory part. Laboratory part of exam is held on computers at the end of all laboratory exercises, and after that on final exams. Theoretical part of exam is written and 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 5 questions some practical and some theoretical. The requirement for passing grade is the positive grade of laboratory part of exam and 50 % points on each midterm exam or the final exam. Grade (in percentage) is formed according to the formula: Grade = 0,5 LV + 0,5 T where: • LV – grade from laboratory part of exam, • T – grade from the theoretical part of exam.

	Title	Number of copies in the library	Availability via other media
Required literature (available in the library and via other media)	• Vicković, L. Algoritms and data structures, lecture notes.		e-learning portal
	• Weiss, M., Data Structures and Algorithm Analysis in C (sections 1-6), Addison-Wesley, 1997.		
	• Sedgewick, R. Algorithms in C, Addison-Wesley, 1990.		
Optional literature (at the time of submission of study programme proposal)	- Neapolitan, R., Naimipour, K. Foundations of Algorithms, Jones & Barlett Learning, 2015.		
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 - Institutional and non-institutional evaluations		
Other (as the proposer wishes to add)			

NAME OF THE COURSE	APPLIED MATHEMATICS							
Code	FEMY02	Year of study	1					
Course teacher	M.Sc. Ivančica Mirošević	Credits (ECTS)	5					
Associate teachers	Lea Dujić	Type of instruction (number of hours)	L	S	AE	LE	DE	
			30		30			
Status of the course	Obligatory	Percentage of application of e-learning	10					

COURSE DESCRIPTION			
Course objectives	Training students for: - application of mathematical concepts and tools from the area of ordinary differential equations, numerical mathematics, statistics and probability to analyze and solve 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)	Students will be able to: - state definitions and theorems from the enitre course, - illustrate theorems with examples, - solve some first and second order differential equations, - apply Laplace transform to linear differential equations - find approximate solution of a nonlinear equation - approximate function with Lagrange interpolation polynomial - approximate empirical data with constant, linear or quadratic function - solve definite integral and Cauchy problem of the first order approximately - use statistical techniques in data analysis - find probability distributions of random variables in random experiments		
Course content broken down in detail by weekly class schedule (syllabus)	Course content	L or S hours	AE hours
	1. Introduction to Differential Equations. Basic concepts and definitions. Equations with separable variables.	2	2
	2. Homogeneous differential equations. Linear differential equations of the first order.	2	2
	3. Differential equations of ¸the second order. Linear differential equations of the second order with constant coefficients.	2	2
	4. Laplace transform – definition and basic properties. Inverse Laplace transform and basic properties.	2	2
	5. Solving linear differential equations with with constant coefficients using Laplace transform.	2	2
	6. Introduction to Numerical mathematics. Solving nonlinear equations. Graphical method. Bisection method. Iterative method.	2	2
	7. Lagrange interpolation polynomial	2	2
	8. Least square method. Approximating empirical data with constant, linear or quadratic function.	2	2
	9. Numerical integration. Trapezoidal rule. Simpson's rule. Euler's method for Cauchy problems.	2	2
	10. Descriptive statistics. Discrete data and continuous data. Numerical characteristics.	2	2
	11. Introduction to Probability theory. Elementary outcomes. Basics of Combinatorics.	2	2
	12. Discrete random variable. Expectation and variance.	2	2

	Binomial distribution. Poisson distribution.		
	13. Continuous random variable. Expectation and variance. Normal distribution.	2	2
	List of laboratory or design exercises		LE or DE hours

Format of instruction	☒ lectures ☐ seminars and workshops ☒ exercises ☐ *on line* in entirety ☐ partial e-learning ☐ field work	☒ independent assignments ☐ multimedia ☐ laboratory ☐ work with mentor ☐ (other)
Student responsibilities	Regular attendence to and active participation in lectures and excercises.	

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	2	Research		Practical training	
	Experimental work		Report		Self study	2.6
	Essay		Seminar essay		(Other)	
	Tests	0.2	Oral exam		(Other)	
	Written exam	0.2	Project		(Other)	

Grading and evaluating student work in class and at the final exam	During semester two mid-term exams are held. The first exam is scheduled after 7 weeks of lectures, and the second in the week following the lectures. At each mid-term exam students can get 40 points, while the remaining 20 points are attained through 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 during 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 is 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: 15% of the best students get the mark excellent (5), next 35% students get the mark very good (4), next 35% students get the mark good (3), and the last 15% students get thet 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 number of points is 100, and the minimum requirement for a passing grade is 50 points. Mid-term exams, final exams and correction exams are held according to the exam schedule.

Required literature (available in the library and via other media)	**Title**	**Number of copies in the library**	**Availability via other media**
	Lecture materials on FESB e-learning portal.		https://elearning.fesb.hr/

Optional literature (at the time of submission of study programme proposal)	T. Bradić, J. Pečarić, R. Roki, M. Strunje: Matematika za tehnološke fakultete, Element, Zagreb, 1998. B. P. Demidovič: Zbirka zadataka iz više matematike, Školska knjiga, Zagreb 1998. Ivo Pavlić, Statisticka teorija i primjena, Zagreb, 1971
Quality assurance methods that ensure the acquisition of exit competences	- homework - short tests - quizzes - mid-term exams - final exam - student questionnaires
Other (as the proposer wishes to add)	

NAME OF THE COURSE	BASIC ELECTRONICS						
Code	FELP02	Year of study	1				
Course teacher	M.Sc. Spomenka Bovan	Credits (ECTS)	5				
Associate teachers		Type of instruction (number of hours)	L	S	AE	LE	DE
			30		15	15	
Status of the course	Obligatory	Percentage of application of e-learning					

COURSE DESCRIPTION

Course objectives	Training students for: - Understanding the main properties of semiconductors and operating principles of the basic electronic devices. - Analysis of simple amplifier circuits with bipolar or field-effect transistors at DC and small-signal AC conditions. - Analysis of basic circuits with operational amplifier.
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: - State the basic properties of semiconductors. - Explain the operating principle of basic semiconductor devices (diodes and transistors). - Calculate main properties of the simple amplifier circuits. - Explain the operation and calculate the properties of the simple circuits with operating amplifier. - Measure the basic parameters of diodes, transistors and amplifiers.

Course content broken down in detail by weekly class schedule (syllabus)

Course content	L hours	AE hours
Introduction. Semiconductor materials. Energy bands in semiconductors. Intrinsic and extrinsic semiconductors.	2	1
Carrier transport phenomena: diffusion and drift transport. Carrier mobilities. Einstein relation. Generation and recombination of carriers.	2	1
Abrupt p-n junction. P-n junction under bias.	2	1
Shockleys equation. Current-voltage characteristics.	2	1
Bipolar junction transistors (BJT). Transistor operation in the active mode. Transistor parameters.	2	1
Static characteristics of BJT. Hybrid model of a BJT.	2	1
Unipolar transistors (FETs). Types of unipolar transistors. JFET and MOSFET: operation, dynamic parameters and static characteristics.	2	1
Introduction to electronic amplifiers. Amplification (relative and in decibels). Types of electronic amplifiers. Common emitter amplifier – DC conditions.	2	1
Common emitter amplifier – dynamic properties.	2	1
Dynamic properties of common source FET amplifier. The amplifier frequency response. Cutoff frequencies.	2	1
Feedback amplifiers. Class A, B , C operation.	2	1
Operational amplifier: definition and basic properties. Examples of circuits with operational amplifier.	2	1
Transistor as a switch. Multivibrator circuits.	2	1

	List of laboratory or design exercises	LE hours
	Semiconductor diode. Zener diode.	3
	Bipolar junction transistor (BJT).	3
	Junction field-effect transistor (JFET).	3
	Common emitter BJT amplifier.	3
	Operational amplifier.	3

Format of instruction	☒ lectures ☐ seminars and workshops ☒ exercises ☐ *on line* in entirety ☐ partial e-learning ☐ field work	☐ independent assignments ☒ multimedia ☒ laboratory ☐ work with mentor ☐ (other)
Student responsibilities	Students should attend at least 70% of the lectures. Students must complete all 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	
	Experimental work		Report		Individual work	2.25
	Essay		Seminar essay		Laboratory exercises	0.5
	Tests	0.15	Oral exam		Preparation for laboratory exercises	0.5
	Written exam	0.1	Project		(Other)	

Grading and evaluating student work in class and at the final exam	There 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 midterm 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 from each midterm or final exam and also have a positive assesment 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 • LV – grade from laboratory exercises given in percentage • M1, M2 – grade from midterms given in percentage Students not passing the midterm exams take part in the final exam. It consists of 20 theoretical questions and numerical problems and lasts 90 minutes. For passing the final exam, students must score at least 50% both from theoretical part and from numerical problems, as well as have a positive assesment of the laboratory exercise. 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 • LV – grade from laboratory exercises given in percentage • FE – grade from final test given in percentage.

<table>
<tr><td rowspan="4">Required literature (available in the library and via other media)</td><td>Title</td><td>Number of copies in the library</td><td>Availability via other media</td></tr>
<tr><td>Spomenka Bovan – autorizirana predavanja (Power Point)</td><td></td><td>e-learning portal</td></tr>
<tr><td>I. Zulim, S. Gotovac: Osnovni poluvodički elektronički elementi, FESB, Split, 1998.</td><td></td><td></td></tr>
<tr><td>S. Bovan: Osnove elektronike – Upute za laboratorijske vježbe, FESB, Split, autorizirana skripta</td><td></td><td></td></tr>
<tr><td>Optional literature (at the time of submission of study programme proposal)</td><td colspan="3">- P. Biljanović: Poluvodički elektronički elementi, Školska knjiga, Zagreb, 2004.
- B. Juzbašić: Elektronički elementi, Školska knjiga, Zagreb, 1984.
- P. Biljanović: Elektronički sklopovi, Školska knjiga, Zagreb, 2005.
- I. Zulim, P. Biljanović: Elektronički sklopovi – zbirka zadataka, Školska knjiga, Zagreb, 1994.
- S.M. Sze, K.K. Ng: Physics of Semiconductor Devices, Wiley, 2006.
- J. Millman, A. Grabel: Microelectronics, 2nd edition, McGraw-Hill, 1987.
- P. Horowitz, W. Hill: The Art of Electronics, Cambridge University Press, 2015.</td></tr>
<tr><td>Quality assurance methods that ensure the acquisition of exit competences</td><td colspan="3">- Record of number of students attending the classes
- Evaluation of results in accordance with expected learning outcomes
- Feedback from students via student surveys
- Teachers self-evaluation
- Institutional and non-institutional evaluations</td></tr>
<tr><td>Other (as the proposer wishes to add)</td><td colspan="3"></td></tr>
</table>

NAME OF THE COURSE	COMPUTER AND DATA SECURITY						
Code	FELP16	Year of study	3				
Course teacher	Julije Ožegović, Ph.D., Full Professor	Credits (ECTS)	5				
Associate teachers	Lada Sartori, Vesna Pekić, Ante Kristic	Type of instruction (number of hours)	L	S	AE	LE	DE
			30	0	0	30	0
Status of the course	Elective	Percentage of application of e-learning	0				

COURSE DESCRIPTION

Course objectives	Training students for: - Course provides basic knowledge of computer systems, networks and data security.		
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 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 broken down in detail by weekly class schedule (syllabus)	Course content	L hours	AE hours
	Information system security organization in project and implementation phases	2	0
	Deep defense methodology. Windows computer hardening.	2	0
	Physical computer security. Password strength. Event logging.	2	0
	Malicious programs. Denial of service and spoofing attacks.	2	0
	UNIX server hardening.	2	0
	Web browser weaknesses. Security parameters. SSL.	2	0
	Active web page, mail server and DNS risks.	2	0
	Communications networks protocols. Wireless transfer technology.	2	0
	Wireless networks protection. Encryption, authentication. NAT.	2	0
	Firewall.	2	0
	Intrusion detection systems.	2	0
	Cryptography essentials.	2	0
	Confidentiality, integrity and authentication.	2	0
	Denial of service attacks. Connection hijacking.	2	0
	Security policies. Government regulations. Persona data integrity.	2	0
	List of laboratory or design exercises		LE hours
	Security properties of Windows operating system.		6
	Windows operating system hardening.		6
	Implementation of Ethereal system.		6
	Security properties of Linux operating system.		6
	Linux operating system hardening.		6

<table>
<tr><td>Format of instruction</td><td colspan="3">☒ lectures
☐ seminars and workshops
☒ exercises
☐ on line in entirety
☐ partial e-learning
☐ field work</td><td colspan="3">☒ independent assignments
☐ multimedia
☒ laboratory
☐ work with mentor
☐ (other)</td></tr>
<tr><td>Student responsibilities</td><td colspan="6">Attend all forms of teaching, pass ingress and egress tests, perform 100% laboratory exercises, pass preliminary exams or full exam (numeric and theory).</td></tr>
<tr><td rowspan="5">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)</td><td>Class attendance</td><td>1</td><td>Research</td><td></td><td>Practical training</td><td>1</td></tr>
<tr><td>Experimental work</td><td></td><td>Report</td><td></td><td>Auditory exercises</td><td></td></tr>
<tr><td>Essay</td><td></td><td>Seminar essay</td><td></td><td>Individual learning</td><td>3</td></tr>
<tr><td>Tests</td><td></td><td>Oral exam</td><td></td><td>(Other)</td><td></td></tr>
<tr><td>Written exam</td><td></td><td>Project</td><td></td><td>(Other)</td><td></td></tr>
<tr><td>Grading and evaluating student work in class and at the final exam</td><td colspan="6">Continuous assessment: laboratory tests, practical tests, knowledge tests, preliminary exams. Exam: written and oral (numeric and theory) as unity.</td></tr>
<tr><td rowspan="7">Required literature (available in the library and via other media)</td><td colspan="3">Title</td><td>Number of copies in the library</td><td>Availability via other media</td></tr>
<tr><td colspan="3">1. Klasić, K.: Zaštita informacijskih sustava, Biblioteka inženjera sigurnosti, Iproz , Zagreb, 2002.</td><td></td><td></td></tr>
<tr><td colspan="3">2. Benak, M.: Plan oporavka u slučaju katastrofe, Savjetovanje CASE 12, Opatija, 2000.</td><td></td><td></td></tr>
<tr><td colspan="3">3. Dragičević, D.: Kompjutorski kriminalitet i informacijski sustavi, Informator, Zagreb, 1999.</td><td></td><td></td></tr>
<tr><td colspan="3">4. Ellis, J. i Speed, T.: The Internet Security Guidebook from Planning to Deployment, Academic Press, 2001.</td><td></td><td></td></tr>
<tr><td colspan="3"></td><td></td><td></td></tr>
<tr><td>Optional literature (at the time of submission of study programme proposal)</td><td colspan="6">- Lecture notes, continuously upgraded
- Upute za laboratorijske vježbe, Internet</td></tr>
<tr><td>Quality assurance methods that ensure the acquisition of exit competences</td><td colspan="6">- Lecture attending evidence
- Annual exam passing analysis
- Student feedback with teacher evaluation
- Teacher self-evaluation
- Graduated students feedback</td></tr>
<tr><td>Other (as the proposer wishes to add)</td><td colspan="6"></td></tr>
</table>

NAME OF THE COURSE	COMPUTER ARCHITECTURES						
Code	FELP04	Year of study	2				
Course teacher	Sven Gotovac, Ph.D., Full Professor	Credits (ECTS)	6				
Associate teachers	Dunja Gotovac, Teaching Assistant	Type of instruction (number of hours)	L	S	AE	LE	DE
			45		15	30	
Status of the course	Obligatory	Percentage of application of e-learning	0				

COURSE DESCRIPTION

Course objectives	Training students for: 1. Understand digital computer architecture. 2. Define difference between different computer architecture on assembler level. 3. Understand computer architecture on the digital circuits level. 4. Understand and apply different computer architecture according to the application problem.		
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)	Students will be able to: 1. Understand difference between computer architecture from the Instruction Set Point of view (ISA) 2. Identify the properties and performance of different architectures at the level of logic circuits 3. Select and apply the appropriate computer architecture according to the problem being solved. 4. Evaluate the impact of architecture on a software solution (advantages and disadvantages).		
Course content broken down in detail by weekly class schedule (syllabus)	Course content	L or S hours	AE hours
	Introduction. Different views on the computer.	3	1
	Data and instructions. Classification of Computers and Their Instructions, Instruction set. Instruction format. Addressing Modes. CISC. RISC.	3	1
	Instruction level processor design (Instruction Set Architecture)	3	1
	Arithmetical and Logical instructions, Instruction for Data Transfer.	3	1
	Flow control instructions, Translation from C to assembler and then to binary code.	3	1
	Processor design on digital circuits level. Single bus microarchitecture.	3	1
	Data Path Implementation, Logic Design for the 1-Bus Microarchitecture.	3	1
	Control Unit design, 2-Bus and 3-Bus Microarchitecture	3	1
	Pipeline architecture.	3	1
	Instruction-Level Parallelism – Problems and Solutions	3	1
	Memory System Design, Memory System Components, Two-Level Memory Hierarchy.	3	1
	Cache, Associative cache, Direct Mapped Cache, 2-way Cache.	3	1
	U/I system design.	3	1

	List of laboratory or design exercises	LE hours
	ARM Architecture - Introduction.	2
	ARM Instruction Set Architecture, Registers, Memory, Stack.	2
	Atmel Studio IDE. Program Structure	2
	Instruction Set, Arithmetical and Logical Instructions, Dana Transfer Instructions, Branch Control Instructions	8
	Procedures	2
	Program Examples	10
	Problems for Exercise and Test	4

Format of instruction	☒ lectures ☐ seminars and workshops ☐ exercises ☐ *on line* in entirety ☐ partial e-learning ☐ field work	☒ independent assignments ☒ multimedia ☒ laboratory ☐ work with mentor ☐ (other)
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	
	Experimental work		Report		Laboratory exercises	1
	Essay		Seminar essay		Preparation for laboratory exercises	1,5
	Tests		Oral exam		Self-study	**2**
	Written exam		Project			

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 lasts 60 minutes and consists of 5 to 7 theoretical questions and numerical problems and final tests consist of 6 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 50 % points on each midterm exam or the final exam. Grade (in percentage) is formed according to the formula: Grade(%) = 0,33 LV + 0,33 (M1 + M2) the activities in percentage: • LV – laboratory assessment, • M1, M2 – test results. The final grade will be determined after the first test term by applying a relative ECTS grading system in accordance with the Regulations on the study and study system of the University of Split. The group of students who passed the exam is divided into four groups: 15% of the best gets the grade A (excellent), 35% of the following B (very good), the next 35% rating C (good), and the last 15% rating D, E). A group of students who did not pass the exam gains FX score (additional work is required), or F (significant additional work is required). In accordance with the Rulebook for Exam, only two exam periods are organized in the exam period after the completion of classes. According to Article 65 of the Statute of the Faculty, the student is obliged to participate in all forms of teaching and attend: lectures at least 70% of teaching hours and laboratory exercises 100% of teaching hours. If you do not meet these conditions, the student will not be able to access the exam

<table>
<tr><td rowspan="5">Required literature (available in the library and via other media)</td><td>Title</td><td>Number of copies in the library</td><td>Availability via other media</td></tr>
<tr><td>• Heuring, V.P., Joredan, H.F.: Computer Systems Design and Architecture, 2rd edition, AddisonWesley, 2003</td><td>2</td><td>Electronic copy On e-learning</td></tr>
<tr><td>• S.Gotovac Authorized lectures from the Digital Computer Architecture</td><td></td><td>On e-learning</td></tr>
<tr><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td></td></tr>
<tr><td>Optional literature (at the time of submission of study programme proposal)</td><td colspan="3">• Hennesy & Patterson, "Computer Architecture: A Quantitative Approach", 5rd edition, Morgan Kaufmann, 2011.</td></tr>
<tr><td>Quality assurance methods that ensure the acquisition of exit competences</td><td colspan="3">1. Class attendance records.
2. Evaluation of results in accordance with the above learning outcomes
3. Feedback from students via surveys
4. Self-evaluation of teachers
5. Feedback from students who have already graduated.
6. Institutional and non-institutional evaluations</td></tr>
<tr><td>Other (as the proposer wishes to add)</td><td colspan="3"></td></tr>
</table>

NAME OF THE COURSE	COMPUTER NETWORKS						
Code	FELP08	Year of study	2				
Course teacher	Julije Ožegović, Ph.D., Full Professor	Credits (ECTS)	5				
Associate teachers	Stipe Braica, Mario Mornar, Vesna Pekić, Ante Kristic	Type of instruction (number of hours)	L	S	AE	LE	DE
			30	0	15	15	0
Status of the course	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
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	Students 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 broken down in detail by weekly class schedule (syllabus)

Course content	L hours	AE hours
Development of data communications networks. Switching methods.	2	1
Importance of standardization. Open systems. Network elements.	2	1
Computer network architecture. Hierarchical layered structures. ISO model.	2	1
Protocols. Protocol mechanism: synchronization, addressing. Error control.	2	1
Traffic and congestion control, flow control.	2	1
Physical level: DTE-DCE interface, RS232, X.24. Modem connections, intelligent modems. Signal codes.	2	1
Local networks. Access methods. Ethernet.	2	1
Wireless local networks. Digital subscriber networks.	2	1
Data level: Error control.	2	1
Character and bit oriented protocols.	2	1
Local networks: MAC, LLC. Ethernet.	2	1
Wireless local networks.	2	1
Network level: Packet networks. Traffic routing.	2	1
Internet. IP protocol (v4, v6), addressing, intranet, routing.	2	1
Transport level: TCP and UDP Internet protocols. TCP protocol flow control.	2	1
List of laboratory or design exercises		LE hours
DTE DCE interface.		2
Modem - data transfer using analogue telephone channel.		2
Local network Ethenet.		2
Connecting computer to Internet subnetwork.		2

	Connecting subnetwork to public Internet.	2
	Virtual local networks.	2
	Wireless local networks	2

Format of instruction	☒ lectures ☐ seminars and workshops ☒ exercises ☐ *on line* in entirety ☐ partial e-learning ☐ field work	☒ independent assignments ☐ multimedia ☒ laboratory ☐ work with mentor ☐ (other)
Student responsibilities	Attend all forms of teaching, pass ingress and egress tests, perform 100% laboratory exercises, pass preliminary exams or full exam (numeric and theory).	

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	Research		Practical training	0,5
	Experimental work		Report		Auditory exercises	0,5
	Essay		Seminar essay		Individual learning	3
	Tests		Oral exam		(Other)	
	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 (available in the library and via other media)	**Title**	**Number of copies in the library**	**Availability via other media**
	5. Turk, S.: Računarske mreže, Školska knjiga, Zagreb, 1991..		
	6. Rožić, N.: Informacije i komunikacije: kodiranje s primjenama, Zagreb 1992.		

Optional literature (at the time of submission of study programme proposal)	- Ožegović, J. Računalne mreže, Veleučilište u Splitu, 2000 - Lecture notes: Ožegović, J., Računalne mreže, continuously upgraded - A. Kristić, V. Pekić: Upute za laboratorijske vježbe, Internet
Quality assurance methods that ensure the acquisition of exit competences	- Lecture attending evidence - Annual exam passing analysis - Student feedback with teacher evaluation - Teacher self-evaluation - Graduated students feedback
Other (as the proposer wishes to add)	

<table>
<tr><td>NAME OF THE COURSE</td><td colspan="6">DATABASES</td></tr>
<tr><td>Code</td><td>FELP22</td><td>Year of study</td><td colspan="5">2.</td></tr>
<tr><td>Course teacher</td><td>Vladan Papić, Ph.D., Full Professor</td><td>Credits (ECTS)</td><td colspan="5">5</td></tr>
<tr><td rowspan="2">Associate teachers</td><td rowspan="2">Tea Marasović, Ph.D., Assistant Professor</td><td rowspan="2">Type of instruction (number of hours)</td><td>L</td><td>S</td><td>AE</td><td>LE</td><td>DE</td></tr>
<tr><td>30</td><td>0</td><td>0</td><td>30</td><td></td></tr>
<tr><td>Status of the course</td><td>Obligatory</td><td>Percentage of application of e-learning</td><td colspan="5">0</td></tr>
<tr><td colspan="7">COURSE DESCRIPTION</td></tr>
<tr><td>Course objectives</td><td colspan="6">Training students for:
- Understanding how typical database work,
- Modelling, normalization and design of simple databases,
- Retreaval, input, deleting and updating of data using simple and complex SQL queries.</td></tr>
<tr><td>Course enrolment requirements and entry competences required for the course</td><td colspan="6">None</td></tr>
<tr><td>Learning outcomes expected at the level of the course (4 to 10 learning outcomes)</td><td colspan="6">Students will be able to:
- Explain basic terms used in databases, types and structures, methodology and life cycle,
- Use standard DBMS,
- Come up with queries for creation and retreaval of dana from tables,
- Translate given E-R diagram into relational form,
- Analyze relations in a database and conclude about level of normalization (up to BCNF),
- Model simple databases according to given specification,</td></tr>
<tr><td rowspan="16">Course content broken down in detail by weekly class schedule (syllabus)</td><td colspan="4">Course content</td><td>L hours</td><td>AE hours</td></tr>
<tr><td colspan="4">DBMS systema architecture. Database types and structures.</td><td>2</td><td></td></tr>
<tr><td colspan="4">Database basics: entities, attributes, cardinality. Multivalue attributes, descriptive attributes and identificators, entity diagrams.</td><td>2</td><td></td></tr>
<tr><td colspan="4">Complex attributes, cardinality of complex attirbutes- Relations, cardinality of entity in relation. E-R diagrams.</td><td>3</td><td></td></tr>
<tr><td colspan="4">Relation types: 1:N, M:N, 1:1. Transformation rules for relational dana model.</td><td>2</td><td></td></tr>
<tr><td colspan="4">Relational rules. Primary and foreign key. Attributes decomposition. Data integrity.</td><td>2</td><td></td></tr>
<tr><td colspan="4">Database normalization: functional dependencies, !NF, 2NF, 3NF, BCNF, 4NF.</td><td>2</td><td></td></tr>
<tr><td colspan="4">Relational algebra: union, intersection, difference, product, projection, selection. Join operations.</td><td>2</td><td></td></tr>
<tr><td colspan="4">Division, logical operators priorities. Dependencies of relational operations.</td><td>2</td><td></td></tr>
<tr><td colspan="4">Database indexing: clustered index, unique index.</td><td>1</td><td></td></tr>
<tr><td colspan="4">SQL database language. Data types.</td><td>2</td><td></td></tr>
<tr><td colspan="4">Table creation. Working with tables</td><td>2</td><td></td></tr>
<tr><td colspan="4">Data input, selection, conditional terms. Forming of output data, sorting and limitations.</td><td>2</td><td></td></tr>
<tr><td colspan="4">Table data updating and deleting. Aliases, aggregate functions.</td><td>2</td><td></td></tr>
</table>

	Group queries. „Having“ conditional clause. Nested queries, subqueries.	2	
	List of laboratory exercises		LE hours
	DBMS architecture. Introduction to DBMS.		2
	ER-diagrams		6
	Database normalization.		3
	Data input, selection, conditional terms.		4
	Creating tables. Structure modifications. Columns deleting and modification. Indexes.		3
	SQL queries.		3
	Complex queries.		2
	Forms.		3
	Input forms.		4

Format of instruction	☒ lectures ☐ seminars and workshops ☐ exercises ☐ *on line* in entirety ☐ partial e-learning ☐ field work	☒ independent assignments ☒ multimedia ☒ laboratory ☐ work with mentor ☐ (other)
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	
	Experimental work		Report		Individual work	1,4
	Essay		Seminar essay	0,8	Laboratory exercises	0,5
	Tests	0,2	Oral exam		Preparation for laboratory exercises	0,5
	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. In the final exams students are answering parts they did not pass in the midterms. The midterm and final exams are carried out as written tests and it lasts for max. 90 minutes. The requirement for passing grade is 40% points on each midterm exam or final exam and positive assessment of laboratory exercises. In final grading (in percentage), each midterm exam contributes with max. 40%, lab. exercises with max. 20% out of total possible points (40%+40%+20%). Final grade is formed in the following way: Percentage Grade 50% to 61% sufficient (2) 62% to 74% good (3) 75% to 87% very good (4) 88% to 100% excellent (5)

Required literature (available in the library and via other media)	**Title**	**Number of copies in the library**	**Availability via other media**
	Papić, V. Databases, lectures. Textbook, FESB (in Croatian)		e-learning portal

Optional literature (at the time of submission of study programme	An Introduction to Database Systems, Eighth Edition by C.J. Date, Addison Wesley 2003. Hector Garcia-Molina, Jeffrey D. Ullman, Jennifer D. Widom: Database Systems: The Complete Book, Prentice-Hall 2002.

proposal)	Clare Churcher, Beginning Database Design From Novice to Professional, Apress, 2007.
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 - Institutional and non-institutional evaluations
Other (as the proposer wishes to add)	

NAME OF THE COURSE	DATABASES 2							
Code	FELP15	Year of study	3.					
Course teacher	Eugen Mudnić, Ph.D., Assistant Professor	Credits (ECTS)	5					
Associate teachers		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 DESCRIPTION

Course objectives	Training students for - Understanding and use of advanced relational database techniques. - Deepening basic knowledge of projecting and use of relational databases.
Course enrolment requirements and entry competences required for the course	Previously taken courses : Databases
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	Students will be able to: - Use database function calls, batch scripts, stored procedures and views. - Understand different database locking mechanisms. - Use database transactional mechanisms. - Implement database error recovery methods. - Administrate multiuser environment. - Connect database with other informational systems. - Make suitable choice of database implementation.

Course content broken down in detail by weekly class schedule (syllabus)

Course content	L hours	AE hours
Introduction.	2	0
Functions and their applications in database processing.	2	0
Views: creating, structure and application, updatable views.	2	0
Basics of database multiuser access. Security and permissions.	2	0
SQL batch instructions.	2	0
Program flow control.	2	0
Transactions: committing requests, rollback, checkpoints, database recovery.	2	0
First midterm exam.		
Stored procedures.	2	0
Error handling.	2	0
Triggers.	2	0
Connecting database with other informational systems.	2	0
Overview of database implementations.	2	0
Database tuning.	2	0
Second midterm exam		

List of laboratory exercises	LE hours
Introduction to development environment. Writing complex SQL queries.	2
Functions	2
Views	2
Multiuser access.	2
Batch SQL Instructions.	2
Program flow control.	2
Transactions.	2
Stored procedures.	2

	Error handling.	2
	Triggers.	2
	Connecting with Java application.	2
	MySQL and POSTGRES databases.	2
	Database performance tuning.	2

Format of instruction	☒ lectures ☐ seminars and workshops ☐ exercises ☐ *on line* in entirety ☐ partial e-learning ☐ field work	☒ independent assignments ☒ multimedia ☒ laboratory ☐ work with mentor ☐ (other)
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	1,0	Research		Practical training	
	Experimental work		Report		Individual work	1,5
	Essay		Seminar essay		Laboratory exercises	1,0
	Tests	0,2	Oral exam		Preparation for laboratory exercises	0,5
	Written exam	0,1	Project	0,7	(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 20 questions 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 50 % points on each midterm exam or the final exam. Grade (in percentage) is formed according to the formula: Grade(%) = 0,05 NP + 0,15 LV + 0,4 (M1 + M2) the activities in percentage: • NP - attendance at lectures, • LV – laboratory assessment, • M1, M2 – test results.

Required literature (available in the library and via other media)	**Title**	**Number of copies in the library**	**Availability via other media**
	Baze podataka; Robert Manger; Element; 2012; ISBN: 987953197576		
	Oracle PL/SQL Programming 5th Edition, Steven Feuerstein Bill Pribyl, 2009.	0	free available on Internet

Optional literature (at the time of submission of study programme proposal)	
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 - Institutional and non-institutional evaluations - Feedback from graduated students
Other (as the proposer wishes to add)	

NAME OF THE COURSE	DESIGNING AND USING COMPUTER NETWORKS							
Code	FELP17	Year of study	3					
Course teacher	Julije Ožegović, Ph.D., Full Professor	Credits (ECTS)	5					
Associate teachers	Lada Sartori, Vesna Pekić, Ante Kristic	Type of instruction (number of hours)	L	S	AE	LE	DE	
			30	0	0	30	0	
Status of the course	Elective	Percentage of application of e-learning	0					

COURSE DESCRIPTION

Course objectives	Training students for: - Course provides basic knowledge of computer networks design, implementation and management.
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: - 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	L hours	AE hours
Architecture and technology of local computer networks.	2	0
Structural cabling architecture.	2	0
Wired and optical local networks components.	2	0
Implementation prerequisites and installation measurements.	2	0
Project documentation parts and design.	2	0
Network elements tagging system.	2	0
Work groups as network project basis.	2	0
Virtual local networks design and management.	2	0
Internet protocols, IP addressing.	2	0
Internet routing.	2	0
Virtual private networks.	2	0
Computer networks virtualization.	2	0
Network services and functions.	2	0
Network management.	2	0
Computer network security projecting.	2	0
List of laboratory or design exercises		LE hours
Structural cabling.		2
Data link measurements.		4
IP addressing and subnetworks.		4
TCP/IP protocol stack and routing.		2
Internet routing protocols.		4
Access lists, NAT, DHCP.		3
Switch management, STP.		3
VLAN management.		2
Wireless local networks.		2

<table>
<tr><td></td><td colspan="5">Complex network system implementation (final test)</td><td>4</td></tr>
<tr><td>Format of instruction</td><td colspan="3">☒ lectures
☐ seminars and workshops
☒ exercises
☐ on line in entirety
☐ partial e-learning
☐ field work</td><td colspan="3">☒ independent assignments
☐ multimedia
☒ laboratory
☐ work with mentor
☐ (other)</td></tr>
<tr><td>Student responsibilities</td><td colspan="6">Attend all forms of teaching, pass ingress and egress tests, perform 100% laboratory exercises, pass preliminary exams or full exam (numeric and theory).</td></tr>
<tr><td rowspan="5">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)</td><td>Class attendance</td><td>1</td><td>Research</td><td></td><td>Practical training</td><td>1</td></tr>
<tr><td>Experimental work</td><td></td><td>Report</td><td></td><td>Auditory exercises</td><td></td></tr>
<tr><td>Essay</td><td></td><td>Seminar essay</td><td></td><td>Individual learning</td><td>3</td></tr>
<tr><td>Tests</td><td></td><td>Oral exam</td><td></td><td>(Other)</td><td></td></tr>
<tr><td>Written exam</td><td></td><td>Project</td><td></td><td>(Other)</td><td></td></tr>
<tr><td>Grading and evaluating student work in class and at the final exam</td><td colspan="6">Continuous assessment: laboratory tests, practical tests, knowledge tests, preliminary exams. Exam: written and oral (numeric and theory) as unity.</td></tr>
<tr><td rowspan="6">Required literature (available in the library and via other media)</td><td colspan="3">Title</td><td>Number of copies in the library</td><td>Availability via other media</td></tr>
<tr><td colspan="3">7. Turk, S.: Računarske mreže, Školska knjiga, Zagreb, 1991..</td><td></td><td></td></tr>
<tr><td colspan="3">8. Rožić, N.: Informacije i komunikacije: kodiranje s primjenama, Zagreb 1992</td><td></td><td></td></tr>
<tr><td colspan="3">9. Ožegović, J., Pezelj I. Projektiranje i upravljanje računalnim mrežama, Veleučilište u Splitu, 2000.</td><td></td><td></td></tr>
<tr><td colspan="3"></td><td></td><td></td></tr>
<tr><td colspan="3"></td><td></td><td></td></tr>
<tr><td>Optional literature (at the time of submission of study programme proposal)</td><td colspan="6">- Lecture notes: Ožegović, J., Projektiranje i korištenje računalnih mreža, continuously upgraded
- Upute za laboratorijske vježbe, Internet</td></tr>
<tr><td>Quality assurance methods that ensure the acquisition of exit competences</td><td colspan="6">- Lecture attending evidence
- Annual exam passing analysis
- Student feedback with teacher evaluation
- Teacher self-evaluation
- Graduated students feedback</td></tr>
<tr><td>Other (as the proposer wishes to add)</td><td colspan="6"></td></tr>
</table>

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 Vesna Pekić, Ph.D. Ante Kristic, Ph.D.	Type of instruction (number of hours)	L	S	AE	LE	DE
			45	0	30	15	0
Status of the course	Obligatory	Percentage of application of e-learning	0				

COURSE DESCRIPTION

Course objectives	Training students for: - Course provides fundamental knowledge of Boolean algebra and automata theory as the digital electronics basis, with practical skills of combinatorial and sequential circuits' synthesis, including programmable structures.
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: - design combinatorial and sequential logic circuit - choose optimal design method - use Boolean algebra properties application - use small, medium and high scale integration circuits - explain the information structure of the system - explain the achieved results of digital system modelling and synthesis

Course content broken down in detail by weekly class schedule (syllabus)

Course content	L hours	AE hours
Digital and analog signals, information and coding.	3	0
Number systems. Binary number system.	3	0
Modulo arithmetic.	2	0
Logic gates.	1	0
Boolean algebra and logic algebra.	2	0
Boolean functions. Decomposition to partial functions.	3	0
Logic algebra complete systems	1	0
Minimization of Boolean function and circuit realization using logic gates.	6	3
Circuit realization using multiplexers and demultiplexers.	3	2
Multiplexer - demultiplexer structures (ROM).	3	2
Programmable logic structures.	3	2
Time relations. Bistables. Bistable synthesis. Registers, shift registers and counters. Memories (RAM).	3	2
Discrete finite digital automata. Specification of automata.	3	2
Minimization of digital automata. Structural synthesis.	6	2
Programmable automata. Wilkies' model. Microprogramming concept. Algorithms	3	0

List of laboratory or design exercises	LE hours
Logic gates.	4
Minimization of Boolean function and circuit realization using logic gates.	4
Circuit realization using multiplexers and demultiplexers.	4
Programmable logic structures synthesis (EPROM, GAL).	4
Bistable synthesis.	4
Finite automata synthesis using logical gates and bistables.	4

	Finite automata synthesis using programmable logic structures (EPROM, GAL). Turing machine simulation.	4
Format of instruction	☒ lectures ☐ seminars and workshops ☒ exercises ☐ *on line* in entirety ☐ partial e-learning ☐ field work	☐ independent assignments ☐ multimedia ☒ laboratory ☐ work with mentor ☐ (other)
Student responsibilities	Attend all forms of teaching, pass ingress and egress tests, perform 100% laboratory exercises, pass preliminary exams or full exam (numeric and theory).	

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	1
	Experimental work		Report		Auditory exercises	0,5
	Essay		Seminar essay		Individual learning	4
	Tests		Oral exam		(Other)	
	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 (available in the library and via other media)	**Title**	**Number of copies in the library**	**Availability via other media**
	10. Ožegović, J. Digitalna i mikroprocesorska tehnika, Veleučilište u Splitu, 2002.		Yes
	11. Župan-Tkalić-Kunštić: Logičko projektiranje digitalnih sustava, Školska knjiga, Zagreb, 1984, 1995.		

Optional literature (at the time of submission of study programme proposal)	- Ožegović, J. Digitalna i mikroprocesorska tehnika, upute za laboratorijske vježbe, interna skripta, FESB Split 1995. - Lecture notes: Ožegović, J., Digitalna elektronika, continuously upgraded
Quality assurance methods that ensure the acquisition of exit competences	- Lecture attending evidence - Annual exam passing analysis - Student feedback with teacher evaluation - Teacher self-evaluation - Graduated students feedback
Other (as the proposer wishes to add)	

NAME OF THE COURSE	ELECTRICAL ENGINEERING						
Code	FENP02	Year of study	1.				
Course teacher	Vicko Dorić, Ph.D., Associate Professor	Credits (ECTS)	6				
Associate teachers	Ivana Zulim, Ph.D.	Type of instruction (number of hours)	L	S	AE	LE	DE
			30	0	15	15	
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 and laws of electrical engineering, - setting up and solving simple electrical circuits, - permanent adoption and deepening of knowledge in the field of electrical engineering.		
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 the fundamental phenomena, the quantities and the laws of electrical engineering, - apply fundamental laws of electrical engineering for the calculation of electromagnetic quantities, - apply methods and techniques for solving of linear electrical networks, - formulate simple electrical networks, - analyse simple electrical networks, - calculate quantities of simple magnetic circuits, - measure basic electrical values (current, voltage, resistance).		
Course content broken down in detail by weekly class schedule (syllabus)	Course content	L or S hours	AE hours
	Introduction to Electrical Engineering. Brief history of electrical engineering. SI units.	2	0
	Electric charges. Electrostatic field and potential.	2	1
	Electrical capacity, capacitors.	2	1
	Magnetic field. Magnetic field lines. Magnetic flux..	2	1
	Electromagnetic induction.	2	1
	Electric currents. Ohm's Law. Voltage and Current sources.	2	1
	Kirchhoff's lows. Power and energy of DC current.	2	1
	Analysis methods for linear circuits.	2	2
	Time varying currents and voltages. Alternating currents and voltages. AC currents effects.	2	1
	Average and effective value. I-U characteristics within AC circuits.	2	1
	Power and energy of AC current.	2	1
	Fazor representation of the harmonic voltages and currents. AC circuits analysis using complex number representation.	2	1
	Resonance. Simple time domain problems.	2	1
	List of laboratory or design exercises		LE or DE hours
	Introduction to laboratory setup.		2
	Serial, parallel and combined resistors.		2
	Kirchhoff's lows, superposition principle and Thevenin's theorem.		2

	Resistor, capacitor and inductor in AC circuits.	2
	Serial (voltage) resonance.	2
	Power and energy of AC current.	2
	Practical skills exam.	3

Format of instruction	☒ lectures ☐ seminars and workshops ☒ exercises ☐ *on line* in entirety ☐ partial e-learning ☐ field work	☐ independent assignments ☒ multimedia ☒ laboratory ☐ work with mentor ☐ (other)
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	2,0	Research		Practical training	
	Experimental work		Report		Individual work	2,7
	Essay		Seminar essay		Laboratory exercises	0,5
	Tests	0,2	Oral exam		Preparation for laboratory exercises	0,5
	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. In the final exams students take tests they didn't pass on the midterm exams. Each midterm test lasts for the 90 min. and consists of 5 theoretical questions and numerical problems. In order to pass the exam, students are required to finish all laboratory exercises and gain at least 50% of total points at each midterm exam or at the final exam. Final grade is determined after the second final test according to the relative grading system. Students which have passed the exam are divided into 4 groups: top 15% of the students get excellent (5) grade, next 35% very good (4) grade, next 35% good (3) grade and last 15% sufficient (2) grade. Students which have failed both final exam, have another exam in the autumn examination periods. Exam lasts for the 90 min. and consists of 5 theoretical questions and numerical problems. Students who gain more than 50% on the last exam are given sufficient (2) grade.

Required literature (available in the library and via other media)	**Title**	**Number of copies in the library**	**Availability via other media**
	V. Pinter: Osnove elektrotehnike, Tehnička knjiga, Zagreb, 1987.	5	
	Felja, I., Koračin, D.: "Zbirka zadataka i riješenih primjera iz osnova elektrotehnike (I i II dio)", Zagreb	5	
	E. Šehović, i drugi: Osnove elektrotehnike zbirka primjera (prvi dio), Školska knjiga, Zagreb, 1992.	5	

Optional literature (at the time of submission of study programme proposal)	B. Jajac: Teorijske osnove elektrotehnike, svezak 1, Graphis, Zagreb, 1998. B. Jajac: Teorijske osnove elektrotehnike, svezak 2, Graphis, Zagreb, 2002.
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 - Institutional and non-institutional evaluations
Other (as the proposer wishes to add)	

NAME OF THE COURSE	ENGLISH LANGUAGE 1						
Code	FEOP02	Year of study	1				
Course teacher	Mira Braović Plavša senior lecturer	Credits (ECTS)	2				
Associate teachers	-	Type of instruction (number of hours)	L	S	AE	LE	DE
				30			
Status of the course	Mandatory	Percentage of application of e-learning	0				

COURSE DESCRIPTION			
Course objectives	Training 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)	Students will be able to: Explain basic notions of electrical engineering, electricity, electromagnetism, electrical charge and conductivity Define and explain the term electronics and explain use of semiconductors and transistors Correctly read numbers, units, equations and other mathematical expressions used in engineering 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) Use phrasal expressions to improve English language knowledge		
Course content broken down in detail by weekly class schedule (syllabus)	Course content	S hours	AE hours
	Introduction to the course, U 1 - Electricity	2	
	Study section 1 – introduction to characteristics of technical English	2	
	U 2 – Electromagnetism	2	
	Study section 2 – general and technical English	2	
	U 3 – Electric charges, electrical conductivity	2	
	Study section 3 – multiword lexical units	2	
	U 4 - Mathematics	2	
	First midterm exam		
	U 5 – Electronics	2	
	Study section 5 – passive voice	2	
	U 6 – Semiconductors	2	
	Study section 6 –reduced relative clauses	2	
	U 7 – Transistors	2	
	Study section 7- *both, either, neither*	2	
	Second midterm exam		

<table>
<tr><td>Format of instruction</td><td colspan="6">☐ lectures
☒ seminars and workshops
☐ exercises
☐ on line in entirety
☐ partial e-learning
☐ field work</td><td colspan="6">☒ independent assignments
☐ multimedia
☐ laboratory
☐ work with mentor
☐ (other)</td></tr>
<tr><td>Student responsibilities</td><td colspan="12">The presence on lectures in the amount of at least 70 % of the times scheduled.
Performed all required exercises.</td></tr>
<tr><td rowspan="5">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)</td><td colspan="2">Class attendance</td><td></td><td colspan="2">Research</td><td></td><td colspan="2">Practical training</td><td></td></tr>
<tr><td colspan="2">Experimental work</td><td></td><td colspan="2">Report</td><td></td><td colspan="2">Individual work</td><td>1</td></tr>
<tr><td colspan="2">Essay</td><td></td><td colspan="2">Seminar essay</td><td></td><td colspan="2">(Other)</td><td></td></tr>
<tr><td colspan="2">Tests</td><td>1</td><td colspan="2">Oral exam</td><td></td><td colspan="2">(Other)</td><td></td></tr>
<tr><td colspan="2">Written exam</td><td></td><td colspan="2">Project</td><td></td><td colspan="2">(Other)</td><td></td></tr>
<tr><td>Grading and evaluating student work in class and at the final exam</td><td colspan="12">There are two midterms and a final exam. The first midterm exam is after 7 weeks of lecturing and the second one is after the next 6 weeks. Students who do not pass both midterm exams have 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 formed according to the score:

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 calendar.</td></tr>
<tr><td rowspan="3">Required literature (available in the library and via other media)</td><td colspan="8">Title</td><td colspan="2">Number of copies in the library</td><td>Availability via other media</td></tr>
<tr><td colspan="8">Štambuk, Anuška (2005). English in Electrical Engineering and Computing. Split: FESB.</td><td colspan="2"></td><td></td></tr>
<tr><td colspan="8">Glendinning, Eric H.; John McEwan (2006). Oxford English for Information Technology. Oxford:OUP</td><td colspan="2"></td><td></td></tr>
<tr><td>Optional literature (at the time of submission of study programme proposal)</td><td colspan="12">Glendinng, Eric H.; Glendinning, Norman (2001). Oxford English for Electrical and Mechanical Engineering. Oxford: Oxford University Press.

Master, Peter (2004). English Grammar and Technical Writing. Washington: US Department of State, Office of English Language Programs.

Mc Carthy, Michael; O'Dell, Felicity. (2008). Academic Vocabulary in Use. Cambridge: Cambridge University Press.</td></tr>
<tr><td>Quality assurance methods that ensure the acquisition of exit competences</td><td colspan="12">Evaluation of results in accordance with the above learning outcomes
Feedback from students via surveys
Self-evaluation of teachers</td></tr>
<tr><td>Other (as the proposer wishes to add)</td><td colspan="12"></td></tr>
</table>

NAME OF THE COURSE	ENGLISH LANGUAGE 2							
Code	FEOP03	Year of study	1					
Course teacher	Mira Braović Plavša senior lecturer	Credits (ECTS)	3					
Associate teachers	-	Type of instruction (number of hours)	L	S	AE	LE	DE	
				30				
Status of the course	Mandatory	Percentage of application of e-learning	0					

COURSE DESCRIPTION

Course objectives	Training 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)	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 broken down in detail by weekly class schedule (syllabus)	Course content	S hours	AE hours
	Revision of the first term vocabulary and grammar	2	
	U 9 – Computer technology	2	
	Study section 9 – adjective comparison	2	
	U 10 – Computers: structure and function	2	
	Study section 10 – word formation: suffixes	2	
	U 11 – Computer programming and computer science	2	
	Study section 11 – word formation: prefixes	2	
	First midterm exam		
	Unit 12 Database management system	2	
	Unit 12 Irregular pulrals of words of Latin and Greek origine	2	
	U 13 - Telecommunications	2	
	Study section 13 – modal verbs	2	
	U 14 – Mobile data systems and internet technology	2	
	Study section 14 – modal verbs cont.	2	
	Second midterm exam		
Format of instruction	☐ lectures ☒ seminars and workshops ☐ exercises ☐ *on line* in entirety ☐ partial e-learning ☐ field work	☒ independent assignments ☐ multimedia ☐ laboratory ☐ work with mentor ☐ (other)	
Student responsibilities	The presence on lectures in the amount of at least 70 % of the times scheduled. Performed all required exercises.		

<table>
<tr><td rowspan="5">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)</td><td>Class attendance</td><td></td><td>Research</td><td></td><td>Practical training</td><td></td></tr>
<tr><td>Experimental work</td><td></td><td>Report</td><td></td><td>Individual work</td><td>1</td></tr>
<tr><td>Essay</td><td></td><td>Seminar essay</td><td></td><td>Presentations</td><td></td></tr>
<tr><td>Tests</td><td>2</td><td>Oral exam</td><td></td><td>(Other)</td><td></td></tr>
<tr><td>Written exam</td><td></td><td>Project</td><td></td><td>(Other)</td><td></td></tr>
<tr><td>Grading and evaluating student work in class and at the final exam</td><td colspan="6">During the semester students are to hold a presentation from their field of profession.
The presentation is evaluated according to the structure and content, delivery, nonverbal communication and visuals and takes 20% points of the overall exam grade.
There are two midterms and a final exam. The first midterm exam is after 7 weeks of lecturing and the second one is after the next 6 weeks. Each midterm exam takes 40% of the overall exam grade. Students who do not pass both midterm exams have 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 formed according to the achieved results from the presentation and the following tests score:

15 % of best solved tests - excellent (5)
30 % of second best solved test - very good (4)
30 % 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 calendar.</td></tr>
<tr><td rowspan="3">Required literature (available in the library and via other media)</td><td colspan="3">Title</td><td>Number of copies in the library</td><td>Availability via other media</td></tr>
<tr><td colspan="3">Štambuk, Anuška (2005). English in Electrical Engineering and Computing. Split: FESB.</td><td></td><td></td></tr>
<tr><td colspan="3">Glendinning, Eric H.; John McEwan (2006). Oxford English for Information Technology. Oxford:OUP</td><td></td><td></td></tr>
<tr><td>Optional literature (at the time of submission of study programme proposal)</td><td colspan="6">Glendinng, Eric H.; Glendinning, Norman (2001). Oxford English for Electrical and Mechanical Engineering. Oxford: Oxford University Press.

Master, Peter (2004). English Grammar and Technical Writing. Washington: US Department of State, Office of English Language Programs.

Mc Carthy, Michael; O'Dell, Felicity. (2008). Academic Vocabulary in Use. Cambridge: Cambridge University Press.</td></tr>
<tr><td>Quality assurance methods that ensure the acquisition of exit competences</td><td colspan="6">Evaluation of results in accordance with the above learning outcomes
Feedback from students via surveys
Self-evaluation of teachers</td></tr>
<tr><td>Other (as the proposer wishes to add)</td><td colspan="6"></td></tr>
</table>

<table>
<tr><td>NAME OF THE COURSE</td><td colspan="6">FINAL THESIS</td></tr>
<tr><td>Code</td><td>FEYY01</td><td>Year of study</td><td colspan="4">3</td></tr>
<tr><td>Course teacher</td><td></td><td>Credits (ECTS)</td><td colspan="4">10</td></tr>
<tr><td rowspan="2">Associate teachers</td><td rowspan="2"></td><td rowspan="2">Type of instruction (number of hours)</td><td>L</td><td>S</td><td>AE</td><td>LE</td><td>DE</td></tr>
<tr><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>Status of the course</td><td>Mandatory</td><td>Percentage of application of e-learning</td><td colspan="4"></td></tr>
<tr><td colspan="7">COURSE DESCRIPTION</td></tr>
<tr><td>Course objectives</td><td colspan="6">Training students for:
- consolidating theoretical knowledge and practical skills in solving highly complex engineering problems
- being independent in solving problems under the given conditions
- writing and presenting the project results</td></tr>
<tr><td>Course enrolment requirements and entry competences required for the course</td><td colspan="6">Acquired 120 ECTS credits</td></tr>
<tr><td>Learning outcomes expected at the level of the course (4 to 10 learning outcomes)</td><td colspan="6">Students will be able to:
- consolidate theoretical knowledge and practical skills in solving problems
- use literature, databases and other sources of information
- select appropriate methods and procedures for solving practical problems
- apply technical knowledge and skills to effectively solve engineering problems
- give public presentation, to prepare written report and present project results</td></tr>
<tr><td>Course content broken down in detail by weekly class schedule (syllabus)</td><td colspan="6">Final thesis is the independent work of the student produced according to the task and instructions given by the supervisor</td></tr>
<tr><td>Format of instruction</td><td colspan="3">☐ lectures
☐ seminars and workshops
☐ exercises
☐ on line in entirety
☐ partial e-learning
☐ field work</td><td colspan="3">☐ independent assignments
☐ multimedia
☐ laboratory
☒ work with mentor
☐ (other)</td></tr>
<tr><td>Student responsibilities</td><td colspan="6">Independent work</td></tr>
<tr><td rowspan="6">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)</td><td>Class attendance</td><td></td><td>Research</td><td></td><td>Practical training</td><td></td></tr>
<tr><td>Experimental work</td><td></td><td>Report</td><td></td><td>Individual work</td><td>10</td></tr>
<tr><td>Essay</td><td></td><td>Seminar essay</td><td></td><td>(Other)</td><td></td></tr>
<tr><td>Tests</td><td></td><td>Oral exam</td><td></td><td>(Other)</td><td></td></tr>
<tr><td>Written exam</td><td></td><td>Project</td><td></td><td>(Other)</td><td></td></tr>
<tr><td colspan="6"></td></tr>
<tr><td>Grading and evaluating student work in class and at the final exam</td><td colspan="6">Final thesis is evaluated by the supervisor based on the student's achievements during the process of the final thesis production and on written and oral presentation.</td></tr>
</table>

	Title	Number of copies in the library	Availability via other media
Required literature (available in the 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	- Self-evaluation of teachers - Student survey of the whole study programme		
Other (as the proposer wishes to add)			

NAME OF THE COURSE	INTERNET PROGRAMMING							
Code	FELP23	Year of study	2					
Course teacher	Ljiljana Šerić, Ph.D., Assistant Professor	Credits (ECTS)	5					
Associate teachers	Marin Bugarić, Ph.D. Andrija Sommer, mag.ing	Type of instruction (number of hours)	L	S	AE	LE	DE
			30	0	0	30	0
Status of the course	Obligatory	Percentage of application of e-learning	30				

COURSE DESCRIPTION

Course objectives	Training students for: - Understanding the operating principles of the Internet - Preparation and processing of data and information for publication on the Web - Designing, editing and maintenance of the content published on the web - Write simple scripts for dynamic web content on.
Course enrolment requirements and entry competences required for the course	Completed courses: Programming 1 Programming 2
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	Students will be able to: 1. Appoint communication protocols used on the Internet 2. Describe the steps of the TCP / IP protocol 3. Identify elements of HTML code 4. Design and write HTML code of Web sites consisting of several web pages 5. Write an external CSS document with instructions for the design of the sites 6. Write simple JavaScript code that dynamically modifies website 7. Explain the difference between client and server scripting technology

Course content broken down in detail by weekly class schedule (syllabus)	Course content	L hours	AE hours
	Introduction. History of the Internet. Internet Communication protocols	6	
	HTML language for web page development. HTML5	4	
	CSS style language. CSS3	4	
	XML, XHTML	2	
	JavaScript, DOM	4	
	Ajax	2	
	jQuerry	2	
	PHP	2	
	Overview of other tehnologijes for web page programming	2	
	List of laboratory or design exercises		LE hours
	Introduction. History of the Internet. Internet Communication protocols		2
	HTML language for web page development. HTML5		4
	CSS style language. CSS3		4
	XML, XHTML		2
	JavaScript, DOM		2
	Ajax		2
	jQuerry		2
	PHP		2
	Overview of other tehnologijes for web page programming		2

<table>
<tr><td>Format of instruction</td><td colspan="6">☒ lectures
☐ seminars and workshops
☒ exercises
☐ on line in entirety
☐ partial e-learning
☐ field work</td><td colspan="2">☒ independent assignments
☒ multimedia
☐ laboratory
☐ work with mentor
☐ (other)</td></tr>
<tr><td>Student responsibilities</td><td colspan="8">The presence on lectures in the amount of at least 70 % of the times scheduled.
Performed all required laboratory exercises.</td></tr>
<tr><td rowspan="6">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)</td><td>Class attendance</td><td>2</td><td>Research</td><td></td><td>Practical training</td><td></td></tr>
<tr><td>Experimental work</td><td></td><td>Report</td><td></td><td>Individual work (Other)</td><td>2</td></tr>
<tr><td>Essay</td><td></td><td>Seminar essay</td><td></td><td>Laboratory exercises (Other)</td><td>0,5</td></tr>
<tr><td>Tests</td><td></td><td>Oral exam</td><td></td><td>Preparation for laboratory exercises (Other)</td><td>0,5</td></tr>
<tr><td>Written exam</td><td></td><td>Project</td><td></td><td>(Other)</td><td></td></tr>
<tr><td colspan="6"></td></tr>
<tr><td>Grading and evaluating student work in class and at the final exam</td><td colspan="8">During the semester there will be two mid-term exams (tests). 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 a computer and consists of 20 random questions to be answered.
At the final exam students can take only parts of material that they did not pass in the mid-term exams
At the final exam ar autmn students take the whole subject matter of the course.
The requirement for passing grade is positively evaluated seminar paper and at least 60% of points achieved on the mid-term / final exam.
The number of points is calculated as the arithmetic average of the two mid-term exams, or the number of points the entire final exam.
The final grade is determined as follows:
Percentage Rating
60% to 69% is sufficient (2)
70% to 79% good (3)
80% to 89% very good (4)
90% 100% Excellent (5)</td></tr>
<tr><td rowspan="5">Required literature (available in the library and via other media)</td><td colspan="5">Title</td><td>Number of copies in the library</td><td>Availability via other media</td></tr>
<tr><td colspan="5">Lj.Šerić, Programiranje za Internet, predavanja, FESB</td><td></td><td>e-learning portal</td></tr>
<tr><td colspan="5">M.Bugarić, upute za laboratorijske vježbe, FESB</td><td></td><td>e-learning portal</td></tr>
<tr><td colspan="5">http://www.w3schools.com</td><td></td><td>web</td></tr>
<tr><td colspan="5"></td><td></td><td></td></tr>
<tr><td>Optional literature (at the time of submission of study programme proposal)</td><td colspan="8">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.</td></tr>
<tr><td>Quality assurance methods that ensure the acquisition of exit competences</td><td colspan="8">• Keeping records of the class attendance
• Annual review of the performance of exam
• Student survey in order to evaluate teachers
• Self-evaluation of teachers
• Feedback from students who have already graduated from about the relevance of the course content</td></tr>
<tr><td>Other (as the proposer wishes to add)</td><td colspan="8"></td></tr>
</table>

NAME OF THE COURSE	INTRODUCTION TO 3D GAME PROGRAMMING						
Code	FELP28	Year of study	3.				
Course teacher	Jadranka Marasović. Ph.D., Full Professor	Credits (ECTS)	5				
Associate teachers	Tea Marasović, Ph.D., Assistant Professor	Type of instruction (number of hours)	L	S	AE	LE	DE
			30	0	0	30	0
Status of the course	Elective	Percentage of application of e-learning	0				

COURSE DESCRIPTION

Course objectives	Enabling students to acquire basic theoretical and practical knowledge on design and development of computer video games – from concept to final implementation – by working through different game examples, with emphasis placed on their programming.		
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)	After completing this course, students will be able to: - use Unity game development platform to create interactive 2D and 3D content; - explain how the physics engine works; - build a simple world using built-in primitive shapes, readily available assets and animated characters imported from 3D modelling programs; - arrange and edit basic GUI elements; - use C# programming language to set up basic game functionality; - apply AI elements in the game; - make a simple computer video game and prepare it for publishing.		
Course content broken down in detail by weekly class schedule (syllabus)	Course content	L hours	AE hours
	Introduction. History of computer games.	2	0
	General game development guidelines.	2	0
	Getting started with Unity. Creating, editing and transforming objects. Materials and textures.	2	0
	Scripting in Unity.	2	0
	Designing the game's GUI: buttons, sliders, status bars and clocks.	4	0
	Introduction to game physics. Rigid bodies. Collison detection and object interaction. Displaying results.	2	0
	Adding sound effects and music. Working with cameras.	2	0
	Particle systems. Skeletal animation basics.	2	0
	Multi-player games. Tic Tac Toe.	2	0
	Artificial intelligence in games.	4	0
	Lighting the world. Creating the final build.	2	0
	List of laboratory or design exercises		LE hours
	Making a simple game: Pong.		2
	Making a simple collection game.		2
	Maze game: Setting up basic functionality.		2
	Maze game: Animating objects in Unity.		2
	Maze game: Saving and loading the game.		2
	3D puzzle game: Level design. Light maps.		2
	3D puzzle game: Staging props.		2
	3D puzzle game: Importing animated characters. Creating movement mechanics.		4
	3D puzzle game: The game manager.		2

<table>
<tr><td>Format of instruction</td><td colspan="6">☒ lectures
☐ seminars and workshops
☐ exercises
☐ on line in entirety
☐ partial e-learning
☐ field work</td><td colspan="6">☒ independent assignments
☐ multimedia
☒ laboratory
☐ work with mentor
☐ (other)</td></tr>
<tr><td>Student responsibilities</td><td colspan="12">Minimum of 70 percent lecture attendance. Completing all the required laboratory exercises.</td></tr>
<tr><td rowspan="5">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)</td><td colspan="2">Class attendance</td><td>1.5</td><td colspan="2">Research</td><td></td><td colspan="2">Practical training</td><td></td></tr>
<tr><td colspan="2">Experimental work</td><td></td><td colspan="2">Report</td><td></td><td colspan="2">Individual work</td><td>1</td></tr>
<tr><td colspan="2">Essay</td><td></td><td colspan="2">Seminar essay</td><td></td><td colspan="2">Laboratory exercises</td><td>1.5</td></tr>
<tr><td colspan="2">Tests</td><td>0.5</td><td colspan="2">Oral exam</td><td></td><td colspan="2">(Other)</td><td></td></tr>
<tr><td colspan="2">Written exam</td><td>0.5</td><td colspan="2">Project</td><td></td><td colspan="2">(Other)</td><td></td></tr>
<tr><td>Grading and evaluating student work in class and at the final exam</td><td colspan="12">During semester, there will be two mid-term exams – according to the class schedule – and/or a project assignment, depending on the agreement with the students. The requirement for the positive grade is the attendance and commitment at the laboratory exercises and a minimum of 40 percent correct answers at each mid-term.

The final grade is determined based on the total number of points earned, which is calculated as follows:

Grade [%] = 0.5 * M1 + 0.5*M2

Percentage Grade
50% to 61% sufficient (2)
62% to 74% good (3)
75% to 87% very good (4)
88% to 100% excellent (5)

The final exam encompasses the entire course load or selected parts of it that students' did not pass at either of mid-term exams. The correction exam encompasses the entire course load. The requirement for passing the exam is minimum of 50 percent correct answers. The exams are held according to the class schedule.</td></tr>
<tr><td rowspan="2">Required literature (available in the library and via other media)</td><td colspan="8">Title</td><td colspan="2">Number of copies in the library</td><td>Availability via other media</td></tr>
<tr><td colspan="8">T. Marasović, J. Marasović; Authorized lectures</td><td colspan="2"></td><td>e-Learning portal</td></tr>
<tr><td>Optional literature (at the time of submission of study programme proposal)</td><td colspan="12">T. Miller; “Beginning 3D Game Programming“, Sams Publishing, 2004, ISBN: 0-672-32661-2.
K. C. Finney; “3D Game Programming All in One”, Premier Press, 2004. ISBN: 1-59200-136-X.</td></tr>
<tr><td>Quality assurance methods that ensure the acquisition of exit competences</td><td colspan="12">- Keeping records on class attendance
- Annual analysis of exam results
- Student survey on teaching performance
- Teacher self-evaluation
- Feedback information from graduates regarding course content relevancy</td></tr>
<tr><td>Other (as the proposer wishes to add)</td><td colspan="12"></td></tr>
</table>

NAME OF THE COURSE	INTRODUCTION TO COMPUTER SCIENCE						
Code	FESP01	Year of study	1.				
Course teacher	Goran Petrović, Ph.D., Associate Proffesor	Credits (ECTS)	5				
Associate teachers	Juraj Alojzije Bosnić, Teaching asistant	Type of instruction (number of hours)	L	S	AE	LE	DE
			30	0	0	30	0
Status of the course	Obligatory	Percentage of application of e-learning	0				

COURSE DESCRIPTION

Course objectives	Training students for: - using computers as office tool - using computers as engineer's tool - creating simple web sites		
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: - 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. - Creating web sites with HTML		
Course content broken down in detail by weekly class schedule (syllabus)	Course content	L hours	AE hours
	History of computers. Computer architecture. Central processing unit. Representing information as bit patterns. Arithmetic/Logic Instructions. Machine language.	2	0
	Hardware: Processor. Random Access Memory, Mass storage: Magnetic systems, Optical systems, Flash drives. Buses. IO channels. Monitors. Scanners. Printers.	2	0
	The History of Operating Systems. File management. Components of an Operating System.	2	0
	Network fundamentals. Network classifications. Protocols. The World Wide Web. Malicious software removal tools.	2	0
	Office tools: Word processing. MS Word environment. Editing. Formatting. Printing.	2	0
	Office tools: Symbols. Tabulators. Tables. Inserting object. Equations. Figures. Drawings. Headers and footers.	2	0
	Office tools: Styles. Templates. Spell check. Bookmarks. Circular letters. Table of content.	2	0
	First midterm exam		
	Office tools: Spreadsheets. MS Excel environment. Editing. Formatting. Printing. Sorting and filtering. Forms. References and functions. Graphs.	2	0
	Office tools: Presentations. MS Power Point environment. Smart Art. MS Visio environment. Drawing.	2	0
	Engineers tools: Introduction to LabVIEW environment. Data types. Simple LabVIEW application for acquire analyze and present data. Using Loops and Decision-Making Structures.	2	0
	Engineers tools: Shift registers. Vectors, Arrays, Matrices. Modular programming in LabVIEW. Implementing File I/O	2	0

<table>
<tr><td rowspan="15"></td><td colspan="2">functions. Automatic report generation.</td><td></td><td></td></tr>
<tr><td colspan="2">Hypertext Markup Language: Editing and Viewing HTML Files. Formatting Text by Using Tags.</td><td>2</td><td>0</td></tr>
<tr><td colspan="2">HTML: Using Lists and Backgrounds. Formatting Paragraphs by Using Style Sheets. Creating Tables. Creating User Forms.</td><td>2</td><td>0</td></tr>
<tr><td colspan="2">Second midterm exam</td><td></td><td></td></tr>
<tr><td colspan="3">List of laboratory exercises</td><td>LE hours</td></tr>
<tr><td colspan="3">Internet: www, E-mail. E- learning. Windows explorer. Accessories.</td><td>3</td></tr>
<tr><td colspan="3">MS Word: Editing. Formatting. Page setup. Printing.</td><td>3</td></tr>
<tr><td colspan="3">MS Word: Symbols. Tabulators. Tables. Inserting object. Equations. Figures. Drawings. Headers and footers.</td><td>3</td></tr>
<tr><td colspan="3">MS Word: Styles. Templates. Spell check. Bookmarks. Circular letters. Table of content.</td><td>3</td></tr>
<tr><td colspan="3">MS Excel: Environment. Editing. Formatting. Printing.</td><td>3</td></tr>
<tr><td colspan="3">MS Excel: Sorting and filtering. Forms. References and functions. Graphs. Pivot table.</td><td>3</td></tr>
<tr><td colspan="3">Editing and Viewing HTML Files. Formatting Text by Using Tags.</td><td>3</td></tr>
<tr><td colspan="3">Formatting Paragraphs by Using Style Sheets. Creating Tables.</td><td>3</td></tr>
<tr><td colspan="3">Practical skills exam</td><td>2</td></tr>
<tr><td>Format of instruction</td><td colspan="4">☒ lectures
☐ seminars and workshops
☒ exercises
☐ on line in entirety
☐ partial e-learning
☐ field work
☐ independent assignments
☒ multimedia
☒ laboratory
☐ work with mentor
☐ (other)</td></tr>
<tr><td>Student responsibilities</td><td colspan="4">The presence on lectures in the amount of at least 70 % of the times scheduled. Performed all required laboratory exercises.</td></tr>
<tr><td rowspan="5">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)</td><td>Class attendance</td><td>1,2</td><td>Research</td><td></td><td>Practical training</td><td></td></tr>
<tr><td>Experimental work</td><td></td><td>Report</td><td></td><td>Individual work</td><td>2</td></tr>
<tr><td>Essay</td><td></td><td>Seminar essay</td><td></td><td>Laboratory exercises</td><td>1,5</td></tr>
<tr><td>Tests</td><td>0,2</td><td>Oral exam</td><td></td><td>Preparation for laboratory exercises</td><td></td></tr>
<tr><td>Written exam</td><td>0,1</td><td>Project</td><td></td><td>(Other)</td><td></td></tr>
<tr><td>Grading and evaluating student work in class and at the final exam</td><td colspan="5">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,
• M1, M2 – test results.</td></tr>
</table>

NAME OF THE COURSE	INTRODUCTION TO DISTRIBUTED INFORMATION SYSTEMS						
Code	FELP26	Year of study	3				
Course teacher	Ljiljana Šerić, Ph.D., Assistant Professor	Credits (ECTS)	5				
Associate teachers	Maja Braović, Ph.D.	Type of instruction (number of hours)	L	S	AE	LE	DE
			30	0	0	30	0
Status of the course	Obligatory	Percentage of application of e-learning	30				

COURSE DESCRIPTION

Course objectives	Training students for: • Distinguish basic types of distributed systems • Know the Basic concepts and technologies for building distributed system • Problems and ways of dealing with problems emerging in the construction of distributed systems		
Course enrolment requirements and entry competences required for the course	Completed courses: Object-oriented programming, Algorithms Data structures		
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	After successfully mastering the subject the students will be able to: 1. Define distributed systems, list the type of distributed systems and describe the differences 2. Classify architectures of distributed systems 3. Describe the performance steps od multi-process and multi-threaded applications 4. Design and implement a simple distributed system in which components communicate using Socket technology, RPC, RMI and Web services 5. Describe naming mechanisms in distributed systems 6. Describe algorithms for synchronization of distributed systems		
Course content broken down in detail by weekly class schedule (syllabus)	Course content	L or S hours	AE hours
	Distributed Information Systems, definitions, objectives, characteristics, types of distributed systems	2	
	The architectures of distributed systems: client-server, P2P, distributed objects architecture, centralized, decentralized, hybrid, cloud arhiektura	2	
	The processes and threads, process states	2	
	The processes of the client and the server. Virtualization	2	
	Communication mechanisms. Interprocess communication (IPC System V IPC)), network communication (Socket, RPC, message oriented models, straming, multicast)	2	
	Sockets, definitions, data preparation. NBO	2	
	Sockets, implementation, C, C #, Java	2	
	RPC	2	
	ORPC (DCOM, RMI, CORBA)	2	
	Message-oriented distributed systems	2	
	Web services, SOAP, REST, XML RPC	2	
	Naming and name resolution	2	
	Process synchronization, time synchronization. UTC, a logical clock, the vector clock	2	

	List of laboratory or design exercises	LE or DE hours
	POSIX threads	2
	C ++ thread library	2
	Socket applications in the programming languages C, C # and Java	6
	RPC applications in C.	4
	RMI applications in Java	4
	DCOM applications in the C-in	2
	Web service in PHP	4
	Compensation of missed exercises	2

Format of instruction	☒ lectures ☐ seminars and workshops ☒ exercises ☐ *on line* in entirety ☐ partial e-learning ☐ field work	☒ independent assignments ☐ multimedia ☐ laboratory ☐ work with mentor ☐ (other)
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	2	Research		Practical training	
	Experimental work		Report		Individual work	2
	Essay		Seminar essay		Laboratory exercises	0,5
	Tests		Oral exam		Preparation for laboratory exercises	**0,5**
	Written exam		Project		(Other)	

Grading and evaluating student work in class and at the final exam	During the semester there will be two written mid-term exams, an oral exam and a final exam. The first mid-term exam will be held in the eighth week of classes, and the other after the end of classes, after which oral exam will be organized. At the oral exam only those students who achieved a total of at least 45% points from tests will participate. Oral exam corresponds to the material of the entire semester. At the final exam students can take only parts of material that they did not pass in the mid-term exams. The requirement for a passing grade of the course is at least 50% points of the total number of points. Rating (%) = ((M1 + M2) / 2 + U) / 2 M1, M2 - points to the mid-term expressed as a percentage. U - the number of points on the oral exam in% The final grade is determined as follows: Percentage Rating 50% to 61% is sufficient (2) 62% to 74% good (3) 75% to 87% of very good (4) 88% 100% Excellent (5) Each pre-exam consists of 10 questions, a final exam consists of 15. Student are required to achieve at least 50% of points of the total number of questions to pass the exam.

<table>
<tr><td rowspan="6">Required literature (available in the library and via other media)</td><td>Title</td><td>Number of copies in the library</td><td>Availability via other media</td></tr>
<tr><td>Andrew S. Tanenbaum, Maarten van Steen: Distributed Systems, Principles and Paradigms, 2007 Pearson Education</td><td>1</td><td>no</td></tr>
<tr><td>Lj.Šerić, M.Štula , Uvod u distribuiranie informacijske sustave, predavanja, FESB</td><td></td><td>e-learning portal</td></tr>
<tr><td>2. M.Braović, upute za laboratorijske vježbe</td><td></td><td>e-learning portal</td></tr>
<tr><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td></td></tr>
<tr><td>Optional literature (at the time of submission of study programme proposal)</td><td colspan="3">Cameron Hughes, Tracey Hughes: Parallel and Distributed Programming Using C++, Addison Wesley 2003
Tom Barnaby: Distributed .NET Programming in C#, Apress 2002
Ajay D. Kshemkalyani, Mukesh Singhal: Distributed Computing, Principles,Algorithms, and Systems, Cambridge University Press 2008</td></tr>
<tr><td>Quality assurance methods that ensure the acquisition of exit competences</td><td colspan="3">• Keeping records of the class attendance
• Annual review of the performance of exam
• Student survey in order to evaluate teachers
• Self-evaluation of teachers
• Feedback from students who have already graduated from about the relevance of the course content</td></tr>
<tr><td>Other (as the proposer wishes to add)</td><td colspan="3"></td></tr>
</table>

NAME OF THE COURSE	INTRODUCTION TO ENTREPRENEURSHIP						
Code	FESY02	Year of study	2.				
Course teacher	Marija Šiško Kuliš, Ph.D., Associate Professor	Credits (ECTS)	4				
Associate teachers		Type of instruction (number of hours)	L	S	AE	LE	DE
			30		15		
Status of the course	Obligatory	Percentage of application of e-learning					

COURSE DESCRIPTION

Course objectives	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.		
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	Students will be able to: 1. To define corectly the terms entrepreneur and entrepreneurship through the thought, content and conceptual basis. 2. To assess and analyze the entrepreneurial activity in the context of economic and engineering dimensions. 3. The strengths and weaknesses accession to the entrepreneurship. 4. To collect and interpret data in the field of market analysis (competition, distributors, partners) and make conclusions regarding issues of entrepreneurial activity. 5. To understand the basic elements of the entrepreneurial accounting and analysis of financial reports. 6. To develop a business plan in the field of engineering entrepreneurship with all necessary, technological, economic and financial parameters. 7. To present their own business plan clearly and unequivocally that will support the feasibility of entrepreneurial investment.		
Course content broken down in detail by weekly class schedule (syllabus)	Course content	L or S hours	AE hours
	1. Introduction - The concept of enterprise and entrepreneurship	2	1
	2. Business idea, brainstorming and focus groups	2	1
	3. Business Plan Part 1	2	1
	4. Business Plan Part 2	2	1
	5. Marketing	2	1
	6. Market Analysis	2	1
	7. Fixed and current assets	2	1
	8. Amortization	2	1
	9. Cost benefit analysis	2	1
	10. Entrepreneurial infrastructure	2	1
	11. Entrepreneurial incubators	2	1
	12. The kinds of entrepreneurship	2	1
	13. Company establishment	2	1
	14. Franchise	2	1
	15. Practice examples and presentation of business plans	2	1

	List of laboratory or design exercises	LE or DE hours

Format of instruction	☒ lectures ☒ seminars and workshops ☒ exercises ☐ *on line* in entirety ☐ partial e-learning ☐ field work	☐ independent assignments ☐ multimedia ☐ laboratory ☐ work with mentor ☐ (other)
Student responsibilities		

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	0.5	Research		Practical training	
	Experimental work		Report		(Other)	
	Essay		Seminar essay		(Other)	
	Tests	1,5	Oral exam	0.5	(Other)	
	Written exam		Project	1,5	(Other)	

Grading and evaluating student work in class and at the final exam	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 and lasts 90 minutes.

	Title	Number of copies in the library	Availability via other media
Required literature (available in the library and via other media)	M. Šiško Kuliš: Autorizirana predavanja, FESB		https://elearning.fesb.unist.hr
	M. Šiško Kuliš: Autorizirana radna bilježnica		https://elearning.fesb.unist.hr
	Kirby, D., A.: Entrepreneurship, McGraw Hill, London, 2003.	0	https://www.amazon.co.uk/Entrepreneurship-David-Kirby/dp/0077098587
	Kolaković, M.: Poduzetništvo u ekonomiji znanja, Sinergija, Zagreb, 2006.	0	http://www.superknjizara.hr/?page=knjiga&id_knjiga=17388
Optional literature (at the time of submission of study programme proposal)	- 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	- registering the class attendance - annual analysis of the performance of the examination - student survey in order to evaluate teachers - self-evaluation of teachers - feedback from students who have already graduated the relevance of content course		
Other (as the proposer wishes to add)			

NAME OF THE COURSE	MATHEMATICS						
Code	FEMY03	Year of study	1				
Course teacher	mr. sc. Ivančica Mirošević	Credits (ECTS)	7				
Associate teachers	Lea Dujić, Marija Čatipović, Marina Mandić	Type of instruction (number of hours)	L	S	AE	LE	DE
			45		45		
Status of the course	Obligatory	Percentage of application of e-learning	10				

COURSE DESCRIPTION

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)	Students will be able to: - state definitions and theorems from the enitre course, - illustrate theorems with examples, - solve systems of linear equations, - apply vector calculus in engineering, - interpret derivatives mathematically, geometrically and physically, - analyse functions of one variable, - test convergence of sequences and series of numbers and functions. - identify integrals which are elementary integrable and solve them. - analyze the extrema of real functions of several variables.		
Course content broken down in detail by weekly class schedule (syllabus)	Course content	L or S hours	AE hours
	1. Introduction. Sets of numbers, complex numbers, trigonometric form of complex number, Moivre formulas.	3	3
	2. Matrices. Basic operations with matrices. Matrix formulation of system of linear equations. Gaussian elimination. Linear independence and rank of a matrix. Kronecker-Capelli theorem.	3	3
	3. Inverse matrix. Determinants. Laplace expansion of a determinant. Cramer's rule.	3	3
	4. Vectors. Basic operations with vectors. Coordinate system. Unit vector and cosines of directions. Linear independence of vectors and basis of a space. Scalar (dot) product, vector product and mixed product.	3	3
	5. Functions of a real variable: defining function, classification of functions. Review of elementary functions.	3	3
	6. Limits and continuity. Asymptotes.	3	3
	7. Derivatives and differential. Tangent and normal. L'Hospital's rule and limits of undetermined forms.	3	3
	8. Monotonicity. Necessary and sufficient conditions for extrema. Curvature. Sufficient condition for convexity and concavity. Necessary and sufficient conditions for inflection points	3	3
	9. Examining functions and drawing graphs.	3	3
	10. Sequences of real numbers. Boundedness, monotonicity and convergence. Boundedness, monotonicity and	3	3

	convergence. Series of real numbers. Sufficient condition for convergence. Convergence criteria. Absolute convergence. Alternating series. Power series of functions and convergence radius.		
	11. Indefinite integrals. Definition and basic properties. Table of basic integrals. Basic techniques of integration.	3	3
	12. Definite integrals. Newton-Leibnitz formulae. Improper integrals. Application of definite integrals.	3	3
	13. The functions of several variables. Partial derivatives. Extrema of functions of several variables.	3	3
	List of laboratory or design exercises		LE or DE hours

Format of instruction	☒ lectures ☐ seminars and workshops ☒ exercises ☐ *on line* in entirety ☐ partial e-learning ☐ field work	☒ independent assignments ☐ multimedia ☐ laboratory ☐ work with mentor ☐ (other)
Student responsibilities	Regular attendence to and active participation in lectures and excercises.	

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	3	Research		Practical training	
	Experimental work		Report		Self study	3.6
	Essay		Seminar essay		(Other)	
	Tests	0.2	Oral exam		(Other)	
	Written exam	0.2	Project		(Other)	

Grading and evaluating student work in class and at the final exam	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 7 weeks of lectures, and the second in the week following the lectures. At the initial 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 exam during 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 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 Statute of FESB: 15% of the best students get the mark excellent (5), next 35% students get the mark very good (4), next 35% students get the mark good (3) and the last 15% students get thet mark sufficient (2). Students who did not pass the course after final exams, and have obtained total of at leat 10 points, can attend the correction exam. On the correction exam maximal number of points is 100, and the minimum requirement for a passing grade is 50 points. Mid-term exams, final exams and correction exams are held according to the exam schedule.

<table>
<tr><td rowspan="6">Required literature (available in the library and via other media)</td><td>Title</td><td>Number of copies in the library</td><td>Availability via other media</td></tr>
<tr><td>Bradić T., Pečarić J., Roki R., Strunje M.: Matematika za tehnološke fakultete, Element Zagreb, 1998.</td><td></td><td></td></tr>
<tr><td>Rivier K.: Zbirka riješenih zadataka I, II, III, Veleučilište u Splitu 2003.</td><td></td><td></td></tr>
<tr><td>Lecture materials on FESB e-learning portal.</td><td></td><td>https://elearning.fesb.unist.hr</td></tr>
<tr><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td></td></tr>
<tr><td>Optional literature (at the time of submission of study programme proposal)</td><td colspan="3">- Šego, B., Matematika za ekonomiste, Narodne novine, Zagreb, 2005.
- I. Slapničar, Matematika 1, FESB, Split, http://lavica.fesb.hr/mat1
- I. Slapničar, Matematika 2, FESB, Split, http://lavica.fesb.hr/mat2
- B. P. Demidovič, Zadaci i riješeni primjeri iz više matematike s primjenom na tehničke nauke, Tehnička knjiga, Zagreb, 1995.
- Dž. Lugić, Matematika II (metodički riješeni zadaci)
- B. Apsen, Repetitorij više matematike 1., 2., 3. i 4, Tehnička knjiga, Zagreb
- S. Pavasović i ostali, Matematika - riješeni zadaci, Građevinski fakultet, Split</td></tr>
<tr><td>Quality assurance methods that ensure the acquisition of exit competences</td><td colspan="3">- homework
- short tests
- quizzes
- mid-term exams
- final exam
- student questionnaires</td></tr>
<tr><td>Other (as the proposer wishes to add)</td><td colspan="3"></td></tr>
</table>

<table>
<tr><td>NAME OF THE COURSE</td><td colspan="6">MICROCONTROLLER GUIDED MOBILE ROBOTS</td></tr>
<tr><td>Code</td><td>FELP20</td><td>Year of study</td><td colspan="4">2.</td></tr>
<tr><td>Course teacher</td><td>Mirjana Bonković, Ph.D., Full Professor
Vladan Papić, Ph.D., Full Professor</td><td>Credits (ECTS)</td><td colspan="4">5</td></tr>
<tr><td rowspan="2">Associate teachers</td><td rowspan="2">Ivo Stančić, Ph.D., Assistant Professor</td><td rowspan="2">Type of instruction (number of hours)</td><td>L</td><td>S</td><td>AE</td><td>LE</td><td>DE</td></tr>
<tr><td>30</td><td>0</td><td>0</td><td>30</td><td>0</td></tr>
<tr><td>Status of the course</td><td>Elective</td><td>Percentage of application of e-learning</td><td colspan="4">0</td></tr>
<tr><td colspan="7">COURSE DESCRIPTION</td></tr>
<tr><td>Course objectives</td><td colspan="6">Training students:
- to develop an understanding and to apply the knowledge from electronics, mechanical engineering and computer science for intelligent system design
- to develop an understanding and be able to analyze mechatronic systems and their components
- to be familiar with concept of mechatronic system control
- to be able to program the microcontroller
- to be able to realize a simple intelligent system</td></tr>
<tr><td>Course enrolment requirements and entry competences required for the course</td><td colspan="6">Finished programming course.</td></tr>
<tr><td>Learning outcomes expected at the level of the course (4 to 10 learning outcomes)</td><td colspan="6">Students will be able to:
- describe the basic components of the embedded/ mechatronic design
- describe properties of widely used sensors in mobile robotics.
- explain different modes of mobile robot control.
- formulate algorithm for path planning, obstacle avoidance and simple navigation.
- demonstrate application of acquired knowledge by programming the appropriate robot behavior</td></tr>
<tr><td rowspan="20">Course content broken down in detail by weekly class schedule (syllabus)</td><td colspan="5">Course content</td><td>L hours</td></tr>
<tr><td colspan="5">The purpose of a microcontroller. Embedded system design principles.</td><td>2</td></tr>
<tr><td colspan="5">Introduction to mechatronic.</td><td>2</td></tr>
<tr><td colspan="5">Mobile robot components.</td><td>2</td></tr>
<tr><td colspan="5">Sensors: sensor characteristics, uncertainty representation, sensor types: incremental encoders, position and orientation sensors, inertial sensors, vision sensors.</td><td>4</td></tr>
<tr><td colspan="5">Mobile robot kinematics. Drive. Mobile robot control modes: on-off control, PID controller, speed and position controller.</td><td>4</td></tr>
<tr><td colspan="5">Navigation: planning and control.</td><td>4</td></tr>
<tr><td colspan="5">Robot soccer</td><td>4</td></tr>
<tr><td colspan="5">Microcontrollers. Arduino IDE for robot control.</td><td>4</td></tr>
<tr><td colspan="5">Flying robot programming and control</td><td>4</td></tr>
<tr><td colspan="5">List of laboratory or design exercises</td><td>LE hours</td></tr>
<tr><td colspan="5">Introduction to the Arduino development environment: hardware components and programming mode.</td><td>2</td></tr>
<tr><td colspan="5">Digital input - output. Serial Monitor.</td><td>2</td></tr>
<tr><td colspan="5">Analog input. PWM output.</td><td>2</td></tr>
<tr><td colspan="5">Motor control. Connection motors and sensors.</td><td>2</td></tr>
<tr><td colspan="5">Line following.</td><td>2</td></tr>
<tr><td colspan="5">Obstacle avoidance.</td><td>4</td></tr>
<tr><td colspan="5">Working on project assignments.</td><td>16</td></tr>
</table>

<table>
<tr><td>Format of instruction</td><td colspan="6">☒ lectures
☐ seminars and workshops
☒ exercises
☐ on line in entirety
☐ partial e-learning
☐ field work</td><td colspan="2">☐ independent assignments
☒ multimedia
☒ laboratory
☒ work with mentor
☐ (other)</td></tr>
<tr><td>Student responsibilities</td><td colspan="8"></td></tr>
<tr><td rowspan="5">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)</td><td>Class attendance</td><td>2</td><td>Research</td><td></td><td>Practical training</td><td></td></tr>
<tr><td>Experimental work</td><td></td><td>Report</td><td></td><td>Individual work</td><td>0,6</td></tr>
<tr><td>Essay</td><td></td><td>Seminar essay</td><td>1</td><td>Laboratory exercises</td><td>0,8</td></tr>
<tr><td>Tests</td><td>0,2</td><td>Oral exam</td><td></td><td>Preparation for laboratory exercises</td><td>0,2</td></tr>
<tr><td>Written exam</td><td>0,2</td><td>Project</td><td></td><td>(Other)</td><td></td></tr>
<tr><td>Grading and evaluating student work in class and at the final exam</td><td colspan="8">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 (in a form of presentation and defense of the project assignment). Each midterm test (as well as the final 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 and 50 % points on average midterm exam ((M1 + M2)/2) or the final exam. 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(%) = 0,1L + 0,4M1 + 0,5M2

where:
• L – laboratory assessment,
• M1, M2 – midterm test results.

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. 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 course the next year.</td></tr>
<tr><td rowspan="5">Required literature (available in the library and via other media)</td><td colspan="5">Title</td><td>Number of copies in the library</td><td>Availability via other media</td></tr>
<tr><td colspan="5">T Siegwart, R., Nourbakhsh, I. R., Scaramuzza D., Autonomous Mobile Robots, MIT Press, 2011.</td><td></td><td>teacher/Internet</td></tr>
<tr><td colspan="5">Thomas Braunl, Embedded Robotics: mobile robot design and applications with embedded systems, Springer, 2006.</td><td></td><td>teacher/Internet</td></tr>
<tr><td colspan="5">S. Thrun, W. Burgard, D. Fox, Probabilistic Robotics, MIT Press, 2006.</td><td></td><td>teacher/Internet</td></tr>
<tr><td colspan="5">Saeed B. Niku: Introduction to Robotics: Analysis, Systems, Applications, Prentice Hall, 2001.</td><td></td><td>teacher</td></tr>
<tr><td>Optional literature (at the time of submission of study programme proposal)</td><td colspan="8">1. Tadej Bajd: Osnove robotike, Fakulteta za elektrotehniko, Univerza v Ljubljani,2000.
2. Kovačić, Laci, Bogdan, Osnove robotike, Fakultet elektrotehnike i računarstva, Zagreb, 1999.</td></tr>
</table>

Quality assurance methods that ensure the acquisition of exit competences	- Keeping records of student attendance. - Annual analysis of course statistics in terms of midterm and finals exams. - Feedback from students via surveys. - Teacher self-evaluation. - Feedback from graduated students (or senior students) on course content relevance. - Periodic institutional evolution of course teachers.
Other (as the proposer wishes to add)	

<table>
<tr><td>NAME OF THE COURSE</td><td colspan="6">MOBILE COMMUNICATION NETWORKS</td></tr>
<tr><td>Code</td><td>FELP19</td><td>Year of study</td><td colspan="5">1.</td></tr>
<tr><td>Course teacher</td><td>Dinko Begušić, Ph.D., Full Professor</td><td>Credits (ECTS)</td><td colspan="5">5</td></tr>
<tr><td rowspan="2">Associate teachers</td><td rowspan="2">Maja Stella, Ph.D., Assistant Professor
Ante Dagelić, Mag. ing
Marina Rajič, Mag. ing.
Josip Žilić, Mag. ing.</td><td rowspan="2">Type of instruction (number of hours)</td><td>L</td><td>S</td><td>AE</td><td>LE</td><td>DE</td></tr>
<tr><td>30</td><td>0</td><td>0</td><td>30</td><td>0</td></tr>
<tr><td>Status of the course</td><td>Elective</td><td>Percentage of application of e-learning</td><td colspan="5"></td></tr>
<tr><td colspan="7">COURSE DESCRIPTION</td></tr>
<tr><td>Course objectives</td><td colspan="6">Training students for:
- understanding and application of basic concepts and technologies of wireless communication systems,
- collaboration in design, development and maintenance of wireless communication networks,
- collaborate in design, development and maintenance of optical communication systems and networks,
- permanent adoption and deepening of the knowledge in the area of wirelessl communication systems and networks.</td></tr>
<tr><td>Course enrolment requirements and entry competences required for the course</td><td colspan="6">None</td></tr>
<tr><td>Learning outcomes expected at the level of the course (4 to 10 learning outcomes)</td><td colspan="6">Students will be able to:
- identify, select and apply wireless communication systems and networks,
- collaborate in design, implementation and maintenance of mobile networks (NMT, GSM, GPRS, EDGE, UMTS, HSDPA, LTE),
- collaborate in design, implementation and maintenance of wireless access networks (WIMAN),
- collaborate in design, implementation and maintenance of wireless local area networks (WLAN, IEEE 802.11x),
- collaborate in design, implementation and maintenance of wireless personal area networks (WPAN, Bluetooth),
- collaborate in design, implementation and maintenance of ad-hoc networks,
- collaborate in design, implementation and maintenance of sattelite commnication networks (LEO, MEO, GEO),
- collaborate in development of services based on wireless communication networks,
- permanently adopt and deepening of the knowledge in the area of wireless communication systems and networks.</td></tr>
<tr><td rowspan="8">Course content broken down in detail by weekly class schedule (syllabus)</td><td colspan="4">Course content</td><td>L or S hours</td><td>AE hours</td></tr>
<tr><td colspan="4">Basic characteristics of wireless communication channels (feding, multipath propagation, Doppler effect).</td><td>2</td><td>-</td></tr>
<tr><td colspan="4">Digital signal processing and diversity combining in wireless commnications.</td><td>2</td><td>-</td></tr>
<tr><td colspan="4">Multiple access techniques and multiplexing (FDMA, TDMA, CDMA, OFDMA).</td><td>2</td><td>-</td></tr>
<tr><td colspan="4">Cellular systems. Interference. Coverage.</td><td>2</td><td>-</td></tr>
<tr><td colspan="4">Mobile networks evolution. First generation networks.</td><td>2</td><td>-</td></tr>
<tr><td colspan="4">Second generation networks.</td><td>2</td><td>-</td></tr>
<tr><td colspan="4">GSM system. Network architecture, physical channels.</td><td>2</td><td>-</td></tr>
</table>

	Implementation and application of discrete time systems.	2	-
	GSM system: logical channels, layered model. 3 Mobile networks 2G+; GPRS, EDGE.	2	-
	Mobile networks 3G+ (UMTS, HSPA).	2	-
	Mobile networks 4G. (LTE, LTE-A). Mobile networks 5G.	2	-
	Wireless access networks. (WMAN); IEEE 802.16. Wireless local networks (WLAN); IEEE 802.11x. Wireless personal area networks (WPAN); Bluetooth., IEEE 802.15	2	-
	Satellite commnication networks (LEO, MEO, GEO). Services in wireless communication networks. Mobile computing and mobile internet.	2	-
	List of laboratory or design exercises		LE hours
	Configuration of IEEE 802.11x based networks.		2
	Configuration of ad-hoc network.		2
	Physical layer in IEEE 802.11x based networks.		2
	MAC layer in IEEE 802.11x based networks.		2
	ESS network configuration.		2
	Authentication and authorization in IEEE 802.11x based networks.		2
	Security in IEEE 802.11x based networks.		2
	Throughput measurement in IEEE 802.11x based networks,		2
	Configura and throughput measurement in Bluetooth systems.		2
	Signalling in GSM networks.		2
	Signalling in UMST networks.		2
	Signalling in LTE networks.		2
	Synchronization in mobile networks.		2

Format of instruction	☒ lectures ☐ seminars and workshops ☒ exercises ☐ *on line* in entirety ☐ partial e-learning ☐ field work	☐ independent assignments ☐ multimedia ☒ laboratory ☐ work with mentor ☐ (other)
Student responsibilities	D..Begušić: Wireless and mobile communication networks, handouts Optional literature (at the time of submission of study programme proposal) □ IEEE Communications Magazine. □ Documents of standardization institutions ITU, ETSI, IEEE and others. □ Scientific papers in the area of wireless and mobile communication networ	

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	1,0	Research	-	Practical training	-
	Experimental work	-	Report	-	Individual work	2,2
	Essay	-	Seminar essay	-	Laboratory exercises	1,0
	Tests	0,2	Oral exam	-	Preparation for laboratory exercises	0,5
	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 and final test consists of 10 theoretical questions and numerical problems. The duration of each test is 2 school hour. 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, the seminar exercise and 50 % points on each midterm exam or the final exam. The continuous knowledge assessment grade (in percentage) is formed according to the formula: Grade(%) = 0,05 NP + 0,15 LV + 0,4 (M1 + M2) the activities in percentage:

<table>
<tr><td></td><td colspan="3">• NP - attendance at lectures,
• LV – laboratory assessment,
• M1, M2 – test results.

The final grade is based on the grade of the continuous knowledge assesment grade and 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 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 from the complete course.</td></tr>
<tr><td rowspan="3">Required literature (available in the library and via other media)</td><td>Title</td><td>Number of copies in the library</td><td>Availability via other media</td></tr>
<tr><td>D.Begušić: Mobile communication networks, handouts, FESB, 2016.</td><td></td><td>e-learning portal</td></tr>
<tr><td></td><td></td><td></td></tr>
<tr><td>Optional literature (at the time of submission of study programme proposal)</td><td colspan="3">- P.M.Shankar: Introduction to Wireless Systems, John Wiley & sons, USA, 2002 - - Documents of standardization institutions ITU, ETSI, IEEE and others.</td></tr>
<tr><td>Quality assurance methods that ensure the acquisition of exit competences</td><td colspan="3">- Evaluation of results in accordance with the above learning outcomes
- Feedback from students via surveys
- Self-evaluation of teachers
- Institutional and non-institutional evaluations</td></tr>
<tr><td>Other (as the proposer wishes to add)</td><td colspan="3"></td></tr>
</table>

NAME OF THE COURSE	MULTIMEDIA NETWORKS AND SYSTEMS						
Code	FELP12	Year of study	2.				
Course teacher	Mladen Russo, Ph.D., Assistant Professor	Credits (ECTS)	5				
Associate teachers	Jelena Čulić, mag. ing. Martina Bašić, mag. ing.	Type of instruction (number of hours)	L	S	AE	LE	DE
			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 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, audio, image and video signals
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 the basic principles of human speech, hearing and vision - explain the basic principles of psychoacoustics and their application in compression of audio signals - demonstrate the frequency masking effect - define the most important algorithms for compression of speech, audio, image and video signals - demonstrate the basic mechanisms of JPEG compression

Course content broken down in detail by weekly class schedule (syllabus)	Course content	L hours	AE hours
	Introduction. History of multimedia systems. Basic terms. Overview of multimedia software tools. Design of multimedia applications.	2	0
	Audio signal. How humans hear and speak. Speech modelling.	2	0
	Generic compression techniques for audio signals. Audio specific algorithms (mp3).	2	0
	Speech specific algorithms (LPC, CELP, RELP, MPE, RPE) and applications in mobile telephony. Review of standards for encoding speech and audio signals.	2	0
	Color in images and video signal. The perception of color (how people perceive electromagnetic radiation). Theory of mixing colors.	2	0
	Color models for image signal (RGB, CMY, CMYK). Color models for video signal (YUV, YIQ, YCbCr). Software-oriented color models (HSB, HLS, HSV). Gamma correction. Image signal (resolution, depth, memory requirements). Image formats (gif, tiff, jfif, ps, bmp).	2	0
	Basics of video and television. Analog television and video. Digital television and video. Video formats and memory requirements.	2	0
	Image compression. JPEG modes.	2	0
	Video compression: H.261. H.263.	2	0
	Video compression: MPEG-1. MPEG -2.	2	0

	Video compression: MPEG-4.	2	0
	Video compression: H.264.	2	0
	Fundamentals of virtual reality. History. Stereoscopic (3D) vision. Software and hardware for virtual reality.	2	0
	List of laboratory or design exercises		LE hours
	Sound recording. Searching of voiced and unvoiced speech. Pitch period.		2
	Speech specific algorithms (LPC)		2
	Frequency masking		2
	3D sound		2
	Image compression (JPEG)		2
	Image compression (JPEG)		2
	Image compression (JPEG)		2
	MPEG – influence of I, P, B frames on video quality		2
	Multimedia systems on mobile devices (Android programming)		2
	Multimedia systems on mobile devices (Android programming)		2
	Multimedia systems on mobile devices (Android programming)		2
	3D images		2
	CAVE system		2

Format of instruction	☒ lectures ☐ seminars and workshops ☒ exercises ☐ *on line* in entirety ☐ partial e-learning ☐ field work	☐ independent assignments ☐ multimedia ☒ laboratory ☐ work with mentor ☐ (other)
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	3	Research		Practical training	
	Experimental work		Report		Individual work	1,7
	Essay		Seminar essay		(Other)	
	Tests	0,2	Oral exam		(Other)	
	Written exam	0,1	Project		(Other)	

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 or 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)

	Title	Number of copies in the library	Availability via other media
Required literature (available in the library and via other media)	• H. Dujmić: Multimedijski sustavi, internal script	1	e-learning portal
Optional literature (at the time of submission of study programme proposal)	• Steinmetz, Nahrstedt: "Multimedia Fundamentals: Media Coding and Content Processing", Prentice Hall, 2002 • Rao, Bojkovic, Milovanovic: "Multimedia Communication Systems: Techniques, Standards and Networks", Prentice Hall, 2002		
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 - Institutional and non-institutional evaluations		
Other (as the proposer wishes to add)			

NAME OF THE COURSE	OBJECT-ORIENTED PROGRAMMING						
Code	FELP10	Year of study	2.				
Course teacher	Toni Jakovčević, Ph.D., Assistant Professor	Credits (ECTS)	7				
Associate teachers		Type of instruction (number of hours)	L	S	AE	LE	DE
			45			30	
Status of the course	Obligatory	Percentage of application of e-learning	0				

COURSE DESCRIPTION

Course objectives	Training students for: - understanding and application of fundamental principles of object-oriented programming - programming applications based on object-oriented paradigm - permanent adoption and deepening of knowledge in object-oriented programming		
Course enrolment requirements and entry competences required for the course	Successfully completed and passed following courses: - Programming 1 - Programming 2		
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	Students will be able to: - Describe the fundamental concepts in object-oriented programming paradigm - Programmatically define the classes necessary for development of basic applications - Demonstrate the usage inheritance and polymorphism in programming - Analyze and interpret object-oriented code - Demonstrate the usage of standard object-oriented libraries		
Course content broken down in detail by weekly class schedule (syllabus)	Course content	L hours	LE hours
	Introduction. Programming languages and the process of compiling.	3	2
	Introduction to object-oriented concepts. Classes and objects. Process of abstraction and software complexity.	3	2
	Thinking in terms of objects. Difference between interface and implementation.	3	2
	Constructors and destructors. Method overloading. Error manipulation and generating exceptions. Abstract data types.	3	2
	Iterative development process. Class wrappers. Interface testing.	3	2
	Inheritance, polymorphism, composition and abstract classes.	3	2
	Portable data, XML I JSON. Using UML diagrams in the development process.	3	2
	Pointers and objects. Taxonomy of UML diagrams.	3	2
	Persistent objects. Serialization and marshalling. Objects and relational databases.	3	2
	Objects in web services. RPC and SOAP interactions.	3	2
	Objects and client-server communication.	3	2
	Design patterns and MVC.	3	2
	Standard template library.	3	2

<table>
<tr><td>Format of instruction</td><td colspan="6">☒ lectures
☐ seminars and workshops
☐ exercises
☐ on line in entirety
☐ partial e-learning
☐ field work</td><td colspan="6">☒ independent assignments
☐ multimedia
☒ laboratory
☐ work with mentor
☐ (other)</td></tr>
<tr><td>Student responsibilities</td><td colspan="12">Lectures attendance of minimum 70% of classes. Successfully completing all of laboratory exercises.</td></tr>
<tr><td rowspan="5">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)</td><td colspan="2">Class attendance</td><td>2.5</td><td colspan="2">Research</td><td></td><td colspan="2">Practical training</td><td></td></tr>
<tr><td colspan="2">Experimental work</td><td></td><td colspan="2">Report</td><td></td><td colspan="2">Individual work</td><td>3.2</td></tr>
<tr><td colspan="2">Essay</td><td></td><td colspan="2">Seminar essay</td><td></td><td colspan="2">Laboratory exercises</td><td>0.5</td></tr>
<tr><td colspan="2">Tests</td><td>0.2</td><td colspan="2">Oral exam</td><td></td><td colspan="2">Preparation for laboratory exercises</td><td>0.5</td></tr>
<tr><td colspan="2">Written exam</td><td>0.1</td><td colspan="2">Project</td><td></td><td colspan="2">(Other)</td><td></td></tr>
<tr><td>Grading and evaluating student work in class and at the final exam</td><td colspan="12">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 4 assignments of which one is a theoretical question, and 3 are programming assignments. 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(%) = 0.1 LV + 0.45 (M1 + M2)
the activities in percentage:
• LV – laboratory assessment,
• M1, M2 – test results.</td></tr>
<tr><td>Required literature (available in the library and via other media)</td><td colspan="7">Title</td><td colspan="3">Number of copies in the library</td><td>Availability via other media</td></tr>
<tr><td colspan="7">T. Jakovčević: Lectures from class – Object-oriented programming, FESB</td><td colspan="3"></td><td>e-learning portal</td></tr>
<tr><td>Optional literature (at the time of submission of study programme proposal)</td><td colspan="12">M. Weisfeld: The Object-Oriented Thought Process (4th Edition), Addison-Wesley Professional, 2013
G. Booch, R. A. Maksimchuk, M. W. Engle, B. J. Young, J. Conallen, K. A. Houston: Object-Oriented Analysis and Design with Applications (3rd Edition), Addison-Wesley Professional, 2007
S. McConnell: Code Complete: A Practical Handbook of Software Construction, Second Edition, Microsoft Press, 2004.</td></tr>
<tr><td>Quality assurance methods that ensure the acquisition of exit competences</td><td colspan="12">- Evaluation of results in accordance with the above learning outcomes
- Feedback from students via surveys
- Self-evaluation of teachers
- Institutional and non-institutional evaluations</td></tr>
<tr><td>Other (as the proposer wishes to add)</td><td colspan="12"></td></tr>
</table>

NAME OF THE COURSE	OPERATING SYSTEMS						
Code	FELP09	Year of study	2				
Course teacher	Sven Gotovac, Ph.D., Full Professor	Credits (ECTS)	7				
Associate teachers	Petra Lončar, Teaching Assistant	Type of instruction (number of hours)	L	S	AE	LE	DE
			45			30	
Status of the course	Obligatory	Percentage of application of e-learning	0				

COURSE DESCRIPTION

Course objectives	Training students for: 1. Understand the architecture, complexity and functionality of the operating system. 2. Understand the methodology of implementing operating system functionalities. 3. Apply and use the functionality of the operating systems in their solutions. 4. Estimate which solutions are appropriate for particular applications.		
Course enrolment requirements and entry competences required for the course	Computer Architecture Data Structures Algorithms		
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	Students will be able to: 1. Understand and explain the operating system architecture and functionality. 2. Distinguish the functionality of the operating system 3. Understand and explain how individual functionalities are solved. 4. Evaluate the performance of individual solutions 5. Choose appropriate solutions for a particular application 6. Use appropriate solutions in their own applications		
Course content broken down in detail by weekly class schedule (syllabus)	Course content	L hours	AE hours
	Introduction to the course, Brief description of topics to be considered, Operating system tasks.	3	
	Process Management, Process Definition, Process Descriptor Block, Process States, Context Switch.	3	
	Implementation of Process Management Systems, Process State Management, CPU Scheduling Algorithms.	3	
	Cooperating Processes, Process Synchronization. Producer-Consumer Problem.	3	
	Test&Set Instruction, Mutex, Semaphores. Producer-Consumer Problem Solution by Semaphores.	3	
	Deadlock Problem. Possible Solutions.	3	
	Memory management system – Introduction to topic.	3	
	Logical vs. Physical Address Space. Logical Address Space Creation.	3	
	Paging	3	
	Virtual Memory.	3	
	I/O Subsystem Architecture	3	
	Interrupt Driven I/O. DMA.	3	
	File Subsystem.	3	
	Disk Block Allocation.	3	
	Real Time Operating Systems.	3	
	List of laboratory or design exercises		LE hours
	Introduction to Linux OS		2
	Linux OS Processes		2

	Linux Processes - Fork Command	2
	Linux processes - communication with pipelines	2
	Windows OS Multitasking	2
	Write multi-tasking programs for the Windows platform	2
	Write multi-threading programs for the Windows platform	2
	Time control of thread execution within the process	2
	Thread Sync Synchronization (Intro, Event)	2
	Synchronization of thread execution (mutex, semaphores)	2
	Java multithreading	2
	Windows interprocess communication	2
	OS on a virtual machine	2

Format of instruction	☒ lectures ☐ seminars and workshops ☐ exercises ☐ *on line* in entirety ☐ partial e-learning ☐ field work	☒ independent assignments ☒ multimedia ☒ laboratory ☐ work with mentor ☐ (other)
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	
	Experimental work		Report		Laboratory exercises	1
	Essay		Seminar essay		Preparation for laboratory exercises	1,5
	Tests		Oral exam		Self-study	**3**
	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 lecturing and the second one is after the next 6 weeks. Each midterm test lasts 60 minutes and consists of 5 to 7 theoretical questions and numerical problems and final tests consist of 6 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 50 % points on each midterm exam or the final exam. Grade (in percentage) is formed according to the formula:

Grade(%) = 0,33 LV + 0,33 (M1 + M2)

the activities in percentage:

- LV – laboratory assessment,
- M1, M2 – test results.

The final grade will be determined after the first test term by applying a relative ECTS grading system in accordance with the Regulations on the study and study system of the University of Split. The group of students who passed the exam is divided into four groups: 15% of the best gets the grade A (excellent), 35% of the following B (very good), the next 35% rating C (good), and the last 15% rating D, E). A group of students who did not pass the exam gains FX score (additional work is required), or F (significant additional work is required). In accordance with the Rulebook for Exam, only two exam periods are organized in the exam period after the completion of classes.

According to Article 65 of the Statute of the Faculty, the student is obliged to participate in all forms of teaching and attend: lectures at least 70% of teaching hours and laboratory exercises 100% of teaching hours. If you do not meet these conditions, the student will not be able to access the exam.

	Title	Number of copies in the library	Availability via other media
Required literature (available in the library and via other media)	• Tanenbaum, A.S.: Woodhull, A.S.: Operating Systems: Design and Implementation, (3rd Edition) Prentice Hall, 2006.	2	Electronic copy on e-learning
	• S.Gotovac Autorizirana predavanja iz Operacijskih sustava		e-learning
Optional literature (at the time of submission of study programme proposal)	• Stalings, W.: Internals and Design Principles (7th Edition), 2011.		
Quality assurance methods that ensure the acquisition of exit competences	1. Class attendance records. 2. Evaluation of results in accordance with the above learning outcomes 3. Feedback from students via surveys 4. Self-evaluation of teachers 5. Feedback from students who have already graduated. 6. Institutional and non-institutional evaluations		
Other (as the proposer wishes to add)			

NAME OF THE COURSE	PC ARHITECTURE							
Code	FELP13	Year of study	3.					
Course teacher	Eugen Mudnić, Ph.D., Assistant Professor	Credits (ECTS)	5					
Associate teachers		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 DESCRIPTION			
Course objectives	Training students for - Understanding of building concepts and structure of PC. - Analysis and selecting of PC components and software. - Understanding of recent PC technologies and forecasting future PC development trends		
Course enrolment requirements and entry competences required for the course	Previously taken courses : Computer programming skills		
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	Students will be able to: - Evaluate the performances of components and the assembled PC. - Define PC hardware specifications for the intended use. - Write optimized applications for target PC platforms. - Evaluate the reliability of individual components and the whole PC. - Maintain PC computers. - Forecast future PC development trends.		
Course content broken down in detail by weekly class schedule (syllabus)	Course content	L hours	AE hours
	Introduction to PC computers.	2	0
	Development of 80x86 and ARM architecture.	2	0
	Modern 80x86 and ARM processors.	2	0
	Computer motherboard.	2	0
	Memory.	2	0
	Power supply system.	2	0
	Graphical and GPU cards.	2	0
	First midterm exam		
	Hard and SSD disks. Flash memory.	2	0
	Notebooks.	2	0
	External communication.	2	0
	Displays.	2	0
	Wireless communication.	2	0
	Printers, scanners and other peripheral units.	2	0
	Second midterm exam		
	List of laboratory exercises		LE hours
	PC benchmarking tools.		2
	80x86 architecture benchmarking.		2
	ARM architecture benchmarking.		2
	Memory benchmarking.		2
	Power consumption measurement and analysis.		2
	GPU card.		2
	Hard disk, SSD and flash memory benchmarks.		2

	Creating filesystems.	2
	Computer boot analysis (BIOS/UEFI).	2
	File transfer throughput measurements.	2
	PC mechanical parts.	2
	PC virtualization.	2
	Backup systems.	2

Format of instruction	☒ lectures ☐ seminars and workshops ☐ exercises ☐ *on line* in entirety ☐ partial e-learning ☐ field work	☒ independent assignments ☒ multimedia ☒ laboratory ☐ work with mentor ☐ (other)
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	1,0	Research		Practical training	
	Experimental work		Report		Individual work	1,5
	Essay		Seminar essay		Laboratory exercises	1,0
	Tests	0,2	Oral exam		Preparation for laboratory exercises	0,5
	Written exam	0,1	Project	0,7	(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 20 questions 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 50 % points on each midterm exam or the final exam. Grade (in percentage) is formed according to the formula: Grade(%) = 0,05 NP + 0,15 LV + 0,4 (M1 + M2) the activities in percentage: • NP - attendance at lectures, • LV – laboratory assessment, • M1, M2 – test results.

Required literature (available in the library and via other media)	**Title**	**Number of copies in the library**	**Availability via other media**
	Građa računala – arhitektura i organizacija računarskih sustava, prof. dr. sc. Slobodan Ribarić		

Optional literature (at the time of submission of study programme proposal)	IT Essentials: PC Hardware and Software, Companion Guide, David Anfinson, Ken Quamme, Cisco Systems, Inc., 2008.
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. - Institutional and non-institutional evaluations. - Feedback from graduated students.
Other (as the proposer wishes to add)	

<table>
<tr><td>NAME OF THE COURSE</td><td colspan="7">PROFESSIONAL TRAINING</td></tr>
<tr><td>Code</td><td>FEYY03</td><td>Year of study</td><td colspan="5">3</td></tr>
<tr><td>Course teacher</td><td>Head of the professional training from the Faculty</td><td>Credits (ECTS)</td><td colspan="5">10</td></tr>
<tr><td rowspan="2">Associate teachers</td><td rowspan="2">Head of the professional training from the private institution</td><td rowspan="2">Type of instruction (number of hours)</td><td>L</td><td>S</td><td>AE</td><td>LE</td><td>DE</td></tr>
<tr><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>Status of the course</td><td>Mandatory</td><td>Percentage of application of e-learning</td><td colspan="5"></td></tr>
<tr><td colspan="8">COURSE DESCRIPTION</td></tr>
<tr><td>Course objectives</td><td colspan="7">Training students for:
- consolidating theoretical knowledge and practical skills in solving highly complex engineering problems
- acquaintance with the organization, work and business of the receiving institution,
- solving practical problems,
- inclusion in the labour market,
- writing technical reports</td></tr>
<tr><td>Course enrolment requirements and entry competences required for the course</td><td colspan="7">Acquired 120 ECTS credits</td></tr>
<tr><td>Learning outcomes expected at the level of the course (4 to 10 learning outcomes)</td><td colspan="7">Students will be able to:
- consolidate theoretical knowledge and practical skills in solving problems
- use literature, databases and other sources of information
- select appropriate methods and procedures for solving practical problems
- apply technical knowledge and skills to effectively solve engineering problems
- prepare a written report on the work results</td></tr>
<tr><td>Course content broken down in detail by weekly class schedule (syllabus)</td><td colspan="7">Professional training is the independent work of the student performed in the receiving institution in accordance with the plan and programme agreed between the head of the professional training from the receiving institution and the head of professional training from the Faculty.</td></tr>
<tr><td>Format of instruction</td><td colspan="3">☐ lectures
☐ seminars and workshops
☐ exercises
☐ on line in entirety
☐ partial e-learning
☒ field work</td><td colspan="4">☒ independent assignments
☐ multimedia
☐ laboratory
☒ work with mentor
☐ (other)</td></tr>
<tr><td>Student responsibilities</td><td colspan="7">Independent work</td></tr>
<tr><td rowspan="6">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)</td><td>Class attendance</td><td></td><td>Research</td><td></td><td>Practical training</td><td colspan="2">7</td></tr>
<tr><td>Experimental work</td><td></td><td>Report</td><td></td><td>Independent work</td><td colspan="2">2</td></tr>
<tr><td>Essay</td><td></td><td>Seminar essay</td><td></td><td>Report writing</td><td colspan="2">1</td></tr>
<tr><td>Tests</td><td></td><td>Oral exam</td><td></td><td>(Other)</td><td colspan="2"></td></tr>
<tr><td>Written exam</td><td></td><td>Project</td><td></td><td>(Other)</td><td colspan="2"></td></tr>
<tr><td colspan="7"></td></tr>
<tr><td>Grading and evaluating student work in class and at the final exam</td><td colspan="7">Professional training is not evaluated. Students are obliged to complete professional training in accordance with the Regulation on professional training and to write a Professional training report. Professional training report is validated by the head of professional training from the receiving institution and the head of professional training from the Faculty.</td></tr>
</table>

Required literature (available in the library and via other media)	**Title**	**Number of copies in the library**	**Availability via other media**
Optional literature (at the time of submission of study programme proposal)			
Quality assurance methods that ensure the acquisition of exit competences	- Questionnaire on professional training - Self-evaluation of the head of professional training - Student survey of the whole study programme		
Other (as the proposer wishes to add)			

<table>
<tr><td>NAME OF THE COURSE</td><td colspan="6">PROGRAMMING 1</td></tr>
<tr><td>Code</td><td>FELP21</td><td>Year of study</td><td colspan="5">1.</td></tr>
<tr><td>Course teacher</td><td>Josip Musić, Ph.D., Assistant Professor</td><td>Credits (ECTS)</td><td colspan="5">10</td></tr>
<tr><td rowspan="2">Associate teachers</td><td rowspan="2">Andrija Sommer, mag. ing.comp. (external collaborator)
Davor Rakočević, mag. ing. comp. (external collaborator)</td><td rowspan="2">Type of instruction (number of hours)</td><td>L</td><td>S</td><td>AE</td><td>LE</td><td>DE</td></tr>
<tr><td>60</td><td>0</td><td>0</td><td>45</td><td>0</td></tr>
<tr><td>Status of the course</td><td>Obligatory</td><td>Percentage of application of e-learning</td><td colspan="5">0</td></tr>
<tr><td colspan="7">COURSE DESCRIPTION</td></tr>
<tr><td>Course objectives</td><td colspan="6">Training students for:
- understanding basic principles and techniques of programing as a core of computer engineering.
- application of acquired knowledge (i.e. programming) on practical examples in VisualBasic programming language.</td></tr>
<tr><td>Course enrolment requirements and entry competences required for the course</td><td colspan="6">None</td></tr>
<tr><td>Learning outcomes expected at the level of the course (4 to 10 learning outcomes)</td><td colspan="6">Students will be able to:
- list basic attributes of .NET platform, data types and standard coding schemes for coding numeric values.
- illustrate coding of numerical values in different numeral systems and with different data types used for storing numerical variables.
- explain value and reference data types.
- apply program flow control structures, decision trees, loops, exception handling as well as bitwise operators.
- demonstrate application of procedures and their overload mechanism.
- apply arrays and data structures.
- describe string immutability and string optimization.
- define basic principles of object oriented programming.
- illustrate by example usage of Window forms.
- apply acquired theoretical knowledge in the Visual Basic programming environment.</td></tr>
<tr><td rowspan="6">Course content broken down in detail by weekly class schedule (syllabus)</td><td colspan="4">Course content</td><td>L or S hours</td><td>AE hours</td></tr>
<tr><td colspan="4">Computer programs and programming languages. Overview of .NET platform. Integrated development environment. First VB .NET application. Using command line for compiling.</td><td>4</td><td>2</td></tr>
<tr><td colspan="4">Basic programming elements. Data types. Value and referent data types. Declaration and usage of variables. Direct and indirect variable declaration.</td><td>4</td><td>2</td></tr>
<tr><td colspan="4">Memory representation of value and referent data types. Built in data types. Integer based data types. Floating point based data types. Other data types. Scope and life cycle of variables. Implicit and explicit data conversion. Constants and operators.</td><td>4</td><td>2</td></tr>
<tr><td colspan="4">Flow control structures. Decision structures. Loop structures. Exceptions. Logical and bitwise operators.</td><td>4</td><td>2</td></tr>
<tr><td colspan="4">Procedure definition and calling. Parameters and arguments. Mechanisms for passing arguments to procedures. Overloading. Recursive procedures.</td><td>4</td><td>2</td></tr>
</table>

	Introduction to arrays. Array declaration and usage. Built in array functionality. Jagged arrays. Sorting and searching of arrays.	4	2
	Stack. Queue. Structure data types. Declaring and using structures. Enumeration.	4	2
	Character and array of characters. Coding standards (Unicode and ASCII). Immutability and optimization of string data types. String based functions. String comparison. String search. Dynamical strings (StringBuilder data type).	4	2
	Introduction to classes and objects. Basic principles of object oriented programming. Comparison of classes and structures. Class declaration and object declaration. Me operator.	4	2
	Properties and property types. Constructors. Overloading.	4	2
	Events. Inheritance. User interfaces. Polymorphism.	4	2
	Windows GUI. Event model in .NET Framework. Windows form class hierarchy. Form properties, procedures and events. Form life cycle. Using standard dialog frames.	4	2
	Overview of Windows form controls. Adding, changing and using Windows controls. Form control hierarchy. Control properties and procedures. Mouse event handling. Keyboard event handling. User input verification.	4	2
	List of laboratory or design exercises		LE or DE hours
	Binary representation of numerical values.		2
	Indirect and direct variable declaration. New and Main procedures. Data types. Loss of precision. Mod operator.		2
	Prime number multipliers. Password entry verification. Odd and even numbers. Leap year. Drawing triangle shaped stars.		2
	Checking number parity and sign. Bit counting. Storing multiple values in one variable.		2
	Procedure call for procedure from different module. Prime numbers. Number digit reversal. Largest common divider.		2
	Binary to decimal and decimal to binary conversion. Number exponentiation.		2
	Rating student cafeteria. Matrix multiplication.		2
	Storing point coordinates. Complex number representation.		2
	Roman number conversion. Palindromes.		2
	Creation and application of classes. Generating unique account number. Using properties.		2
	Events. Inheritance. Interfaces. Polymorphism.		2
	Money exchange. Cancelling form close event.		2
	Solving quadratic equation. Designing of dialog frame. Mouse and keyboard events.		2

Format of instruction	☒ lectures ☐ seminars and workshops ☒ exercises ☐ *on line* in entirety ☐ partial e-learning ☐ field work	☐ independent assignments ☒ multimedia ☒ laboratory ☐ work with mentor ☐ (other)
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*	Class attendance	4,5	Research		Practical training	
	Experimental work		Report		Individual work	3,5
	Essay	0,4	Seminar		Laboratory exercises	1,3

total number of ECTS credits is equal to the ECTS value of the course)			essay			
	Tests	0,2	Oral exam		Preparation for laboratory exercises	0,1
	Written exam	0,2	Project		(Other)	

Grading and evaluating student work in class and at the final exam	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 practical problems. In the final exams students that did not pass the midterm exams take part. The final exam test consists of 10 theoretical questions and practical 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 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(%) = 0,2L + 0,4(M1 + M2) where: • L – laboratory assessment, • M1, M2 – midterm test results. The final grade is determined after completion of midterm exams and second final exam by application of relative ECTS grading scheme in accordance with University of Split Ordinance on study and studying systems (Article 21). Students that have completed the exam (i.e. those that have 50% or more) are divided into four subgroups: - top 15% of students receive Excellent (5) grade, - next 35% of students receive Very Good (4) grade, - next 35% of students receive Good (3) grade, while - bottom 15% of students receive Sufficient (2) grade. 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. 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 course the next year.

	Title	**Number of copies in the library**	**Availability via other media**
Required literature (available in the library and via other media)	T. Žuljević: "Uvod u programiranje – VB.NET", Intus informatika, Zagreb, 2011	2	book shop FESB
	J. Liberty: "Programiranje Visual Basic 2005"	1	
	J. Musić, T. Žuljević: Authorized lecture notes, FESB		e-learning portal

Optional literature (at the time of submission of study programme proposal)	1. H. M. Deitel, P. J. Deitel, and T. R. Nieto: " Visual Basic.NET How to Program" , Prentice Hall, 2002. 2. The Microsoft Developer Network Library, https://msdn.microsoft.com/en-us/library/ms123401.aspx
Quality assurance methods that ensure the acquisition of exit competences	- Keeping records of student attendance. - Annual analysis of course statistics in terms of midterm and finals exams. - Feedback from students via surveys. - Teacher self-evaluation.

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

NAME OF THE COURSE	PROGRAMMING 2							
Code	FELP03	Year of study	1					
Course teacher	Linda Vicković, Ph.D., Associate Professor	Credits (ECTS)	10					
Associate teachers	Ivica Crnjac, Teaching Assistant	Type of instruction (number of hours)	L	S	AE	LE	DE	
			60		30	30		
Status of the course	Obligatory	Percentage of application of e-learning	0					

COURSE DESCRIPTION

Course objectives	Training students for: - understanding and appliance of basic programming knowledge in C programming language, - usage of standard functions from C libraries like input / output and mathematical functions, - Writing C program functions, pointer usage, dynamic memory allocation and structures.
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 fundamentals related to writing, compiling, linking and executing C programs, - write, build and execute simple C programme, - using functions, pointers and dynamic memory allocation in programmes, - using user's data types like structures and unions, - imply data input from data files and data storage in data files, - using debugger for problems solving.

Course content broken down in detail by weekly class schedule (syllabus)	Course content	L or S hours	AE hours
	Introduction to C semantic. Comments. Basic data types. Variables.	4	2
	Pre-processor's statements. Arithmetic expressions. Prefix/postfix increment/decrement operators.	4	2
	Data input from keypad. Relation operators. for loop.	4	2
	Making decisions – if statement. Logical operators in compound relations. while loop, do while loop and switch statement.	4	2
	Working with arrays. Defining an array. Character arrays – strings. Standard functions for manipulating arryas of characters. String and char input from keypad.	4	2
	Multidimensional arrays.	4	2
	Functions. Scope of the variable. Parameters transfer by value and by reference. Array as a function's argument. recursive functions	4	2
	Data conversion in C. ASCCI values	4	2
	Structures. Enumerated data type. Unions. Array of structures. Structure containing structures.	4	2
	Pointers. Address operator. Pointer to integer and character. Pointer to arrays of integers and characters. Pointers to structures. Pointers inside structures..	4	2
	Input and output operations with files.	4	2
	Dynamic memory allocation.	4	2

<table>
<tr><td></td><td colspan="3">break, continue statements. exit function. System calls. Arguments of the main function. Pre-processors statements. Conditional compilation, Pointers to functions.</td><td>4</td><td>2</td></tr>
<tr><td></td><td colspan="4">List of laboratory or design exercises</td><td>LE or DE hours</td></tr>
<tr><td></td><td colspan="4">First C program. Program compiling, linking and executing. Writing to the screen. For loop examples</td><td>2</td></tr>
<tr><td></td><td colspan="4">Data input from keypad. If statement and logical operators in compound relations.</td><td>2</td></tr>
<tr><td></td><td colspan="4">while loop, do-while loop and random numbers.</td><td>2</td></tr>
<tr><td></td><td colspan="4">Switch statement and integer arrays.</td><td>2</td></tr>
<tr><td></td><td colspan="4">Character arrays and standard functions for manipulating character arrays.</td><td>2</td></tr>
<tr><td></td><td colspan="4">Two-dimensional arrays of integers.</td><td>2</td></tr>
<tr><td></td><td colspan="4">Functions</td><td>2</td></tr>
<tr><td></td><td colspan="4">Recursive functions</td><td>2</td></tr>
<tr><td></td><td colspan="4">Structures.</td><td>2</td></tr>
<tr><td></td><td colspan="4">Pointers to basic data types. Pointers to arrays and structures.</td><td>2</td></tr>
<tr><td></td><td colspan="4">Input and output operations with files.</td><td>2</td></tr>
<tr><td></td><td colspan="4">Dynamic memory allocation.</td><td>2</td></tr>
<tr><td>Format of instruction</td><td colspan="2">☒ lectures
☐ seminars and workshops
☒ exercises
☐ on line in entirety
☐ partial e-learning
☐ field work</td><td colspan="3">☐ independent assignments
☒ multimedia
☒ laboratory
☐ work with mentor
☐ (other)</td></tr>
<tr><td>Student responsibilities</td><td colspan="5">The presence on lectures in the amount of at least 70 % of the times scheduled. Performed all required laboratory exercises.</td></tr>
<tr><td>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)</td><td>Class attendance</td><td>4</td><td>Research</td><td></td><td>Practical training</td><td></td></tr>
<tr><td></td><td>Experimental work</td><td></td><td>Report</td><td></td><td>(Other)</td><td>3</td></tr>
<tr><td></td><td>Essay</td><td></td><td>Seminar essay</td><td></td><td>(Other)</td><td>1,4</td></tr>
<tr><td></td><td>Tests</td><td>0,2</td><td>Oral exam</td><td></td><td>(Other)</td><td>1,3</td></tr>
<tr><td></td><td>Written exam</td><td>0,1</td><td>Project</td><td></td><td>(Other)</td><td></td></tr>
<tr><td>Grading and evaluating student work in class and at the final exam</td><td colspan="5">There are two parts of the exam, theoretical and laboratory part. Laboratory part of exam is held on computers at the end of all laboratory exercises, and after that on final exams. Theoretical part of exam is written and 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 15 questions some practical and some theoretical. The requirement for passing grade is the positive grade of laboratory part of exam and 50 % points on each midterm exam or the final exam. Grade (in percentage) is formed according to the formula:
Grade = 0,5 LV + 0,5 T
where:
• LV – grade from laboratory part of exam,
• T – grade from the theoretical part of exam.</td></tr>
</table>

	Title	Number of copies in the library	Availability via other media
Required literature (available in the library and via other media)	Vicković, L. Programiranje 2, prezentacije s predavanja.		e-learning portal
	Mateljan I. Računala i programiranje, skripta, FESB, Split, 2004		
	Byron S.Gottfried: "Programming with C", Schaum's Outlines, McGraw-Hill, New York, 1996.		
	Besplatne knjige i tečajevi na internetu: http://www.freeprogrammingresources.com/ctutor.html		
Optional literature (at the time of submission of study programme proposal)	-		
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 - Institutional and non-institutional evaluations		
Other (as the proposer wishes to add)			

NAME OF THE COURSE	PROGRAMMING FOR ANDROID						
Code	FELP29	Year of study	3.				
Course teacher	Toni Jakovčević, Ph.D., Assistant Professor	Credits (ECTS)	5				
Associate teachers		Type of instruction (number of hours)	L	S	AE	LE	DE
			30			30	
Status of the course	Elective	Percentage of application of e-learning	0				

COURSE DESCRIPTION

Course objectives	Training students for: - application of fundamental programming principles for Android operating system - development of application for Android operating system - presenting the functioning of Android operating system on the programmatic level - using the native sensors and the corresponding programming interfaces		
Course enrolment requirements and entry competences required for the course	Successfully completed and passed following courses: - Programming - Object-oriented programming		
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	Students will be able to: - Describe the fundamental concepts in Android programming - Define the program structure necessary for the development of basic Android applications - Create a user interface for an Android application - Use the programming interface for working with native sensors - Demonstrate the use of local and on-line multimedia resources		
Course content broken down in detail by weekly class schedule (syllabus)	Course content	L hours	LE hours
	Introduction. Basic concepts. Writing basic Android programs.	2	2
	Creating applications and activities. Introduction to services. Application manifest. Application lifecycle. Application class.	2	2
	Introduction to Intents. Broadcasting Intents. Intent Filters. Monitoring device changes.	2	2
	Using internet resources. Connecting to the internet and downloading resources. Download manager.	2	2
	Working with files. Managing application preferences. Managing local filesystem.	2	2
	Working with databases. Asynchronous queries. Searching within the application.	2	2
	Working with services. Binding services to activities. Creating background threads.	2	2
	User interfaces. Working with notifications. Interfaces non-dependent on resolution. Hardware acceleration.	2	2
	Working with device sensors. Available sensor types. Device orientation. Interpreting sensor values.	2	2
	Working with maps. Geocoding. Working with location-based services.	2	2
	Working with multimedia. Using the device camera sensor.	2	2
	Connectivity over Wi-Fi network. Monitoring internet connectivity. Configuring Wi-Fi. Connecting to Bluetooth devices.	2	2
	Initiating phone calls and sending SMS and MMS messages. Working with incoming SMS messages.	2	2

<table>
<tr><td>Format of instruction</td><td colspan="6">☒ lectures
☐ seminars and workshops
☐ exercises
☐ on line in entirety
☐ partial e-learning
☐ field work</td><td colspan="6">☒ independent assignments
☐ multimedia
☒ laboratory
☐ work with mentor
☐ (other)</td></tr>
<tr><td>Student responsibilities</td><td colspan="12">Lectures attendance of minimum 70% of classes. Successfully completing all of laboratory exercises.</td></tr>
<tr><td rowspan="5">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)</td><td colspan="2">Class attendance</td><td>1.5</td><td colspan="2">Research</td><td></td><td colspan="2">Practical training</td><td></td></tr>
<tr><td colspan="2">Experimental work</td><td></td><td colspan="2">Report</td><td></td><td colspan="2">Individual work</td><td>2.2</td></tr>
<tr><td colspan="2">Essay</td><td></td><td colspan="2">Seminar essay</td><td></td><td colspan="2">Laboratory exercises</td><td>0.5</td></tr>
<tr><td colspan="2">Tests</td><td>0.2</td><td colspan="2">Oral exam</td><td></td><td colspan="2">Preparation for laboratory exercises</td><td>0.5</td></tr>
<tr><td colspan="2">Written exam</td><td>0.1</td><td colspan="2">Project</td><td></td><td colspan="2">(Other)</td><td></td></tr>
<tr><td>Grading and evaluating student work in class and at the final exam</td><td colspan="12">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 4 assignments of which one is a theoretical question, and 3 are programming assignments. 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(%) = 0.1 LV + 0.45 (M1 + M2)
the activities in percentage:
• LV – laboratory assessment,
• M1, M2 – test results.</td></tr>
<tr><td>Required literature (available in the library and via other media)</td><td colspan="8">Title</td><td colspan="2">Number of copies in the library</td><td>Availability via other media</td></tr>
<tr><td colspan="8">T. Jakovčević: Lectures from class – Programming for programming, FESB</td><td colspan="2"></td><td>e-learning portal</td></tr>
<tr><td>Optional literature (at the time of submission of study programme proposal)</td><td colspan="12">R. Meier: Professional Android 4 Aplplication Development, Wrox Press, 2012
J. Annuzzi Jr., L. Darcey, S. Conder: Advanced Android Application Development (4th Edition), Addison-Wesley, 2014
B. Phillips, B. Hardy: Android Programming: The Big Nerd Ranch Guide (1st Edition), Big Nerd Ranch Inc., 2013</td></tr>
<tr><td>Quality assurance methods that ensure the acquisition of exit competences</td><td colspan="12">- Evaluation of results in accordance with the above learning outcomes
- Feedback from students via surveys
- Self-evaluation of teachers
- Institutional and non-institutional evaluations</td></tr>
<tr><td>Other (as the proposer wishes to add)</td><td colspan="12"></td></tr>
</table>

NAME OF THE COURSE	PROGRAMMING IN JAVA						
Code	FELP11	Year of study	3.				
Course teacher	Eugen Mudnić, Ph.D., Assistant Professor	Credits (ECTS)	6				
Associate teachers		Type of instruction (number of hours)	L	S	AE	LE	DE
			30	0	0	30	
Status of the course	Obligatory	Percentage of application of e-learning	0				

COURSE DESCRIPTION

Course objectives	Training students for - Use Java language and environment. - Use object oriented program design.		
Course enrolment requirements and entry competences required for the course	Previously taken courses : C programming		
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	Students will be able to: - Establish Java development environment. - Write Java applications. - Use object oriented programming model. - Use Java system libraries. - Use complex development environment. - Predict Java code performance.		
Course content broken down in detail by weekly class schedule (syllabus)	Course content	L hours	AE hours
	Introduction to Java and comparison to other C languages. Basic Java application.	2	0
	Java class, methods and attributes declaration. Class member access.	2	0
	Encapsulation. Constructors. Packages.	2	0
	Identificators, keywords and data types. Variables, declaration, assignment. Construction and initialization of objects. References. Java coding conventions.	2	0
	Variable scope. Operators. Program flow control (loops and branches). Arrays.	2	0
	Inheritance. Class derivation. Polymorphism. Access control.	2	0
	Methods and constructor overload. Methods override. Object class. Wrapper classes.	2	0
	First midterm exam.		
	Advanced class features. Abstract classes. Interfaces.	2	0
	Exceptions. Exceptions handling. Exception categories. Custom exceptions.	2	0
	Java console applications. Java command line arguments. Using console I/O functions. Using file I/O functions.	2	0
	Java utility classes.	2	0
	Java GUI. Frame and panel components.	2	0
	Java threads. Java threads control. Java threads synchronization.	2	0
	Second midterm exam		
	List of laboratory exercises		LE hours
	Java virtual machine. Hello World application.		2
	Eclipse development environment.		2
	Numbers and Strings. Reading input.		2

	Class design. Class Student.	2
	Java applets.	2
	Conditional operators.	2
	Class definition – class Robot	2
	Arrays and complex data structures.	2
	Class extension. Combining related classes.	2
	Exceptions in input/output operations.	2
	Java threads. Thread management. Thread synchronization.	2
	Java GUI. Event handling.	2
	Java database connection.	2

Format of instruction	☒ lectures ☐ seminars and workshops ☐ exercises ☐ *on line* in entirety ☐ partial e-learning ☐ field work	☒ independent assignments ☒ multimedia ☒ laboratory ☐ work with mentor ☐ (other)
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	2,0	Research		Practical training	
	Experimental work		Report		Individual work	2,0
	Essay		Seminar essay	0,2	Laboratory exercises	1,5
	Tests	0,2	Oral exam		Preparation for laboratory exercises	0,0
	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 20 questions 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 50 % points on each midterm exam or the final exam. Grade (in percentage) is formed according to the formula: Grade(%) = 0,05 NP + 0,15 LV + 0,4 (M1 + M2) the activities in percentage: • NP - attendance at lectures, • LV – laboratory assessment, • M1, M2 – test results.

Required literature (available in the library and via other media)	**Title**	**Number of copies in the library**	**Availability via other media**
	E. Mudnic, Authorized lectures.		
	The Java Language Specification, Java SE 7 Edition (Java Series)	0	free available on Internet

Optional literature (at the time of submission of study programme proposal)	The Java Tutorial: A Short Course on the Basics (5th Edition)
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 - Institutional and non-institutional evaluations - Feedback from graduated students
Other (as the proposer wishes to add)	

<table>
<tr><td>NAME OF THE COURSE</td><td colspan="7">PROGRAMMING IN THE UNIX ENVIRONMENT</td></tr>
<tr><td>Code</td><td>FELP07</td><td>Year of study</td><td colspan="5">2</td></tr>
<tr><td>Course teacher</td><td>Krstinić Damir, Ph.D., Associate Professor</td><td>Credits (ECTS)</td><td colspan="5">5</td></tr>
<tr><td rowspan="2">Associate teachers</td><td rowspan="2"></td><td rowspan="2">Type of instruction (number of hours)</td><td>L</td><td>S</td><td>AE</td><td>LE</td><td>DE</td></tr>
<tr><td>30</td><td></td><td></td><td>30</td><td></td></tr>
<tr><td>Status of the course</td><td>Obligatory</td><td>Percentage of application of e-learning</td><td colspan="5">30%</td></tr>
<tr><td colspan="8">COURSE DESCRIPTION</td></tr>
<tr><td>Course objectives</td><td colspan="7">Training students for:
understanding the principles of the unix operating system
understanding and using unix environment
using unix development environments and tools
application development for unix operating system</td></tr>
<tr><td>Course enrolment requirements and entry competences required for the course</td><td colspan="7">Compleeted course "Introduction to computer science and programming"</td></tr>
<tr><td>Learning outcomes expected at the level of the course (4 to 10 learning outcomes)</td><td colspan="7">Students will be able to:
appoint main unix standards and conventions
understand and describe concepts and working principles of the unix operating system
identify and understand elements of unix shell scripts, create simple unix shell scripts
use develompent environments and tools on the unix operating system
develop programs for the unix operating system
understand Makefile ruels
create Makefile rules for automatization of the compiling and linking</td></tr>
<tr><td rowspan="16">Course content broken down in detail by weekly class schedule (syllabus)</td><td colspan="5">Course content</td><td>L or S hours</td><td>AE hours</td></tr>
<tr><td colspan="5">Introduction, historical review, unix basics</td><td>2</td><td></td></tr>
<tr><td colspan="5">File system, shell, basic commands, file system permissions</td><td>2</td><td></td></tr>
<tr><td colspan="5">Introduction to shell scripts</td><td>2</td><td></td></tr>
<tr><td colspan="5">Simple unix program, source and object code, compiling and linking, gcc, make utility</td><td>2</td><td></td></tr>
<tr><td colspan="5">Memory image of the unix process, unix process environment, stack and heap, functions, recursion</td><td>2</td><td></td></tr>
<tr><td colspan="5">Processes, function main, command line arguments</td><td>2</td><td></td></tr>
<tr><td colspan="5">Creating new unix process</td><td>2</td><td></td></tr>
<tr><td colspan="5">Preliminary exam</td><td>2</td><td></td></tr>
<tr><td colspan="5">Unix file, file descriptors, read and write system calls, positioning in the file</td><td>2</td><td></td></tr>
<tr><td colspan="5">Process cloning and open files, file sharing, atomic operations</td><td>2</td><td></td></tr>
<tr><td colspan="5">Replacing the memory image of the process</td><td>2</td><td></td></tr>
<tr><td colspan="5">Unix signals</td><td>2</td><td></td></tr>
<tr><td colspan="5">Introduction to interprocess communication, pipes, fifos, sockets, System V IPC</td><td>2</td><td></td></tr>
<tr><td colspan="5">Preliminary exam</td><td>2</td><td></td></tr>
</table>

	List of laboratory or design exercises	LE or DE hours
	Introduction to unix shell, using unix operating system	4
	Compiling and linking	2
	Command line arguments	2
	Working with files	4
	Standard input and output	4
	Creating a new process	4
	Starting a new program (exec functions)	4
	Input/output redirection	4
	Signals	2

Format of instruction	☒lectures ☐seminars and workshops ☐exercises ☐*on line* in entirety ☒partial e-learning ☐field work	☒independent assignments ☒multimedia ☒laboratory ☐work with mentor ☐ (other)
Student responsibilities		

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	Research		Practical training	1
	Experimental work		Report		(Other)	
	Essay	1.5	Seminar essay		(Other)	
	Tests	1.5	Oral exam		(Other)	
	Written exam		Project		(Other)	

Grading and evaluating student work in class and at the final exam	The final grade is determined based on: • assesment of laboratory exercices • assesment of written seminar essay and its oral presentation • grade achieved in two peliminary exams, or grade achieved in final exam, if positive grade was not achieved in one or both preliminary exams

	Title	**Number of copies in the library**	**Availability via other media**
Required literature (available in the library and via other media)	On-line course script: http://www.csc.unist.hr/~dkrst/unix/		
	Stevens, W. R.; Rago, S. A., Advanced Programming in the UNIX Environment, Addison-Wesley Professional Computing Series, ISBN 978-0-321-63773-4		
Optional literature (at the time of submission of study programme proposal)			
Quality assurance methods that ensure the acquisition of exit competences	• Evaluation of resutls in accordance with the above learning outcomes • Feedback from student via surveys • Self-evaluation of teachers • Institutional and non-institutional evaluations		

Other (as the proposer wishes to add)	

NAME OF THE COURSE	SOFTWARE ENGINEERING						
Code	FELP25	Year of study	2.				
Course teacher	Linda Vicković, Ph.D., Associate Professor	Credits (ECTS)	5				
Associate teachers		Type of instruction (number of hours)	L	S	AE	LE	DE
			30	0	0	30	
Status of the course	Obligatory	Percentage of application of e-learning					

COURSE DESCRIPTION

Course objectives	Training students for: - understanding and usage of engineering approach to software development, - how to write user requirements specification, software design specification and test plan documents in software development process, - applying acquired knowledge in the practical software development.		
Course enrolment requirements and entry competences required for the course	Students have to pass Object oriented programming from the second year of study.		
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	Students will be able to: - define fundamental terms of engineering approach in software development, - identify different steps in software development, - differ agile and classical software development methods, - provide required documents during software development process, - using UML diagrams for software architecture description, - recognize different architecture and design patterns, - describe different software verification and validation phases, - define importance of software evolution.		
Course content broken down in detail by weekly class schedule (syllabus)	Course content	L hours	AE hours
	Introduction in Software engineering.	2	0
	Software processes and software process models.	2	0
	Agile software development. Extreme programming..	2	0
	Scrum and Scaling agile methods.	2	0
	Software requirements.	2	0
	The software requirements document. Requirements elicitation, analysis and validation.	2	0
	System modelling. Introduction to UML.	2	0
	Architectural design.	2	0
	Architectural patterns.	2	0
	Design and implementation. Design patterns.	2	0
	Software testing.	2	0
	Test driven development	2	0
	Software maintenance and evolution.	2	0
	List of laboratory or design exercises		LE hours
	Advanced features of Microsoft Office for document formatting.		2
	Using Microsoft Project in project management.		2
	Using Microsoft Visio for system modelling (UML diagrams).		2
	Using testing package in Microsoft Visual Studio.		2
	Visiting lecture – Project management.		2
	Visiting lecture – Estimation effort for software development product.		2
	Visiting lecture – Scrum methodology for software development.		2

<table>
<tr><td></td><td colspan="6">Visiting lecture – Kanban methodology for software development.</td><td>2</td></tr>
<tr><td></td><td colspan="6">Visiting lecture – Software testing</td><td>2</td></tr>
<tr><td></td><td colspan="6">Visiting lecture – Software engineering in Ericsson Nikola Tesla – environment, market and evolution.</td><td>2</td></tr>
<tr><td>Format of instruction</td><td colspan="3">☒ lectures
☐ seminars and workshops
☐ exercises
☐ on line in entirety
☐ partial e-learning
☐ field work</td><td colspan="4">☒ independent assignments
☒ multimedia
☒ laboratory
☐ work with mentor
☐ (other)</td></tr>
<tr><td>Student responsibilities</td><td colspan="7">The presence on lectures in the amount of at least 70 % of the times scheduled. Performed all required laboratory exercises.</td></tr>
<tr><td rowspan="6">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)</td><td>Class attendance</td><td>1</td><td>Research</td><td></td><td>Practical training</td><td>1</td></tr>
<tr><td>Experimental work</td><td></td><td>Report</td><td></td><td>Individual work</td><td>2</td></tr>
<tr><td>Essay</td><td></td><td>Seminar essay</td><td></td><td>Laboratory exercises</td><td>0,5</td></tr>
<tr><td>Tests</td><td>0,2</td><td>Oral exam</td><td></td><td>Preparation for laboratory exercises</td><td>0,2</td></tr>
<tr><td>Written exam</td><td>0,1</td><td>Project</td><td></td><td>(Other)</td><td></td></tr>
<tr><td colspan="6"></td></tr>
<tr><td>Grading and evaluating student work in class and at the final exam</td><td colspan="6">There are two parts of the exam, practical and theoretical. For practical part students have to make a software project and related documentations. It is done in groups from 3 to 5 students. Project is divided in three phases and each is graded. Finale project grade is counted as average.
Theoretical part of exam is written and 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. The requirement for passing grade is the positive grade from project part and 50 % points on each midterm exam or the final exam. Grade (in percentage) is formed according to the formula:
Grade = 0,6 P + 0,4 T
where:
• P – project grade,
• T – grade from the theoretical part of exam.</td></tr>
<tr><td rowspan="5">Required literature (available in the library and via other media)</td><td colspan="4">Title</td><td>Number of copies in the library</td><td>Availability via other media</td></tr>
<tr><td colspan="4">Vicković, L. Programsko inženjerstvo, prezentacije s predavanja.</td><td></td><td>e-learning portal</td></tr>
<tr><td colspan="4">Somerville, I. Software engineering, Addison Wesley, 9 edition, 2011.</td><td></td><td></td></tr>
<tr><td colspan="4">Sach, S. Object Oriented Software Engineering, McGraw-HIll, 2008.</td><td></td><td></td></tr>
<tr><td colspan="4">Fowler, M. UML Distilled, Addison Wesley, third edition, 2003.</td><td></td><td></td></tr>
</table>

Optional literature (at the time of submission of study programme proposal)	
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 - Institutional and non-institutional evaluations
Other (as the proposer wishes to add)	

NAME OF THE COURSE	SYSTEM ANALYSIS AND DESIGN						
Code	FELP27	Year of study	3				
Course teacher	Maja Štula, Ph.D., Full Professor	Credits (ECTS)	5				
Associate teachers		Type of instruction (number of hours)	L	S	AE	LE	DE
			30			30	
Status of the course	Obligatory	Percentage of application of e-learning	10%				

COURSE DESCRIPTION

Course objectives	Training students for: - Acquiring knowledge on methodologies and tools used for information system analysis and development - Understanding information system analysis and design processes - Acquiring basic knowledge necessary for defining, developing, managing and deployment of information systems
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 methods and techniques for information system analysis and design - Explain differences in IT systems development methodologies - Explain reasons for usage of formally defined methodologies - Use software tools for information system analysis and design

Course content broken down in detail by weekly class schedule (syllabus)	Course content	L or S hours	AE hours
	System analysis and design introduction, system development life cycle, software development methodologies	3	3
	Project initiation, identification, setting system request, feasibility study	2	2
	Project management, project size assessment, function point approach, project workplan, Gant, PERT diagrams, CASE tools	2	2
	System requirements identification, requirements analysis techniques, JAD (Joint Application Development)	2	2
	Use case analysis, elements	2	2
	Process modelling, Data Flow Diagram, process model definition, DFD hierarchy	2	2
	Data modelling, Entity-Relation diagram, data dictionary, ER diagram validation and normalization	2	2
	Developing system design from system request, system design strategies, strategy selection factors	2	2
	System architecture design, basic software architecture types, operational, security requirements, hardware and software specification	3	3
	User interface design, user experience, navigation, input, output design	2	2
	Program design, converting logical process model to physical, structure chart development, program specification	2	2
	Data storage design, files, databases, choosing format of storage, converting logical data model to physical, data storage optimization	2	2
	Information system implementation, programming tasks assignment, activities coordination, testing, documenting	2	2

	Information system introduction, maintenance and customers support	2	2
	List of laboratory or design exercises		LE or DE hours
	GIT versioning system usage		4
	Project feasibility analysis, ROI, BEP for case study project		4
	Unit Test definition and execution		6
	Creating and maintaining workplan with gant diagram using software tools		4
	Use case definition for case study		4
	Data models and CRUD matrix creation		4
	System architecture design		4

Format of instruction	☒ lectures ☐ seminars and workshops ☒ exercises ☐ *on line* in entirety ☐ partial e-learning ☐ field work	☐ independent assignments ☐ multimedia ☒ laboratory ☐ work with mentor ☐ (other)
Student responsibilities	The presence on lectures in the amount of at least 70 % of the times scheduled. Performed and uploaded on e-learning portal 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	3	Research		Practical training	
	Experimental work		Report		(Other)	
	Essay		Seminar essay		(Other)	
	Tests	1	Oral exam		(Other)	
	Written exam	1	Project		(Other)	

Grading and evaluating student work in class and at the final exam

There are two midterms and final exams duration of 90 minutes. 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 final tests consist of 10 theoretical questions (five from each midterm test). 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 50 % points on each midterm exam or the final exam and positive laboratory assessment. Grade (in percentage) is formed according to the formula:

Grade(%) = (M1 + M2)/2

the activities in percentage:

- M1, M2 – test results.

Required literature (available in the library and via other media)

Title	Number of copies in the library	Availability via other media
M. Štula, Authorized lecture materials		e-learning portal

Optional literature (at the time of submission of study programme proposal)

- Dennis, Haley Wixom, M. Roth: Systems Analysis and Design, Fourth Edition, 2009.
- Christian Dawson: Project in Computing and Information Systems: A Student's Guide, 2009.

Quality assurance methods that ensure

- Students' surveys for teacher evaluation
- Students attendance track

the acquisition of exit competences	- Annual statistic on passed exam
Other (as the proposer wishes to add)	

NAME OF THE COURSE	WINDOWS PROGRAMMING						
Code	FELP14	Year of study	3				
Course teacher	Maja Štula, Ph.D., Full Professor	Credits (ECTS)	5				
Associate teachers		Type of instruction (number of hours)	L	S	AE	LE	DE
			30			30	
Status of the course	Elective	Percentage of application of e-learning	10%				

COURSE DESCRIPTION

Course objectives	Training students for: - Understanding functioning of Microsoft Windows operating systems and communication between application and OS - Acquiring basic knowledge necessary for development of applications based on .NET 2.x and .NET 3.x frameworks - Acquiring knowledge on desktop applications with graphical interface
Course enrolment requirements and entry competences required for the course	Object oriented programming Data structures Algorithms
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	Students will be able to: - Use .NET environment - Understand MS windows application functioning - Design and develop simple graphical user interface for desktop application - Choose appropriate user controls for required application functions - Choose suitable .NET framework to fulfil user application requirements

Course content broken down in detail by weekly class schedule (syllabus)	Course content	L hours	AE hours
	Microsoft Windows operating system, GUI history, dynamic linking, native API	2	-
	NET framework 2.x, 3.x, 4.x structure, .NET basic elements and properties	2	-
	Application entry point, message loop, working with messages	3	-
	Creating windows, windows types, hierarchy, .NET 2.x and 3.x windows	3	-
	XAML language	3	-
	Controls, windows, application resources	3	-
	MDI application, tab design, navigation design	2	-
	Working with data, data binding	3	-
	WPF triggers and animations	2	-
	GDI+ and WPF graphics subsystem	3	-
	Windows 8 OS, windows Store application	4	-
	List of laboratory or design exercises		LE hours
	Different data types in .NET applications, NET 2.x and .NET 3.x applications with basic GUI with basic window		4
	Developing UI in XAML		6
	User controls		8
	MVVM (Model-View-ViewModel) pattern introduction		6
	LINQ, Extension methods, Anonymous types		6

Format of instruction		
	☒ lectures ☐ seminars and workshops ☒ exercises ☐ *on line* in entirety ☐ partial e-learning ☐ field work	☐ independent assignments ☐ multimedia ☒ laboratory ☐ work with mentor ☐ (other)

<table>
<tr><td>Student responsibilities</td><td colspan="6">The presence on lectures in the amount of at least 70 % of the times scheduled. Performed and uploaded on e-learning portal all required laboratory exercises.</td></tr>
<tr><td rowspan="5">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)</td><td>Class attendance</td><td>2,5</td><td>Research</td><td></td><td>Practical training</td><td></td></tr>
<tr><td>Experimental work</td><td></td><td>Report</td><td></td><td>(Other)</td><td></td></tr>
<tr><td>Essay</td><td></td><td>Seminar essay</td><td>1,5</td><td>(Other)</td><td></td></tr>
<tr><td>Tests</td><td>0,2</td><td>Oral exam</td><td>0,6</td><td>(Other)</td><td></td></tr>
<tr><td>Written exam</td><td>0,2</td><td>Project</td><td></td><td>(Other)</td><td></td></tr>
<tr><td>Grading and evaluating student work in class and at the final exam</td><td colspan="6">There are two midterms and final exams duration of 90 minutes. 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 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(%) = (M1 + M2)/2
the activities in percentage:
• M1, M2 – test results.</td></tr>
<tr><td rowspan="6">Required literature (available in the library and via other media)</td><td colspan="3">Title</td><td>Number of copies in the library</td><td>Availability via other media</td></tr>
<tr><td colspan="3">M. Štula: Programiranje korisničkih sučelja na Windows platformama, 2010, University textbook, FESB</td><td>1</td><td></td></tr>
<tr><td colspan="3">M. Štula, Authorized lecture materials</td><td></td><td>e-learning portal</td></tr>
<tr><td colspan="3"></td><td></td><td></td></tr>
<tr><td colspan="3"></td><td></td><td></td></tr>
<tr><td colspan="3"></td><td></td><td></td></tr>
<tr><td>Optional literature (at the time of submission of study programme proposal)</td><td colspan="6">- C# 3.0 Unleashed With the .NET Framework 3.5, Joseph Mayo
- Foundations of WPF: An Introduction to Windows Presentation Foundation, Laurence Moroney, Apress</td></tr>
<tr><td>Quality assurance methods that ensure the acquisition of exit competences</td><td colspan="6">- Students’ surveys for teacher evaluation
- Students attendance track
- Annual statistic on passed exam</td></tr>
<tr><td>Other (as the proposer wishes to add)</td><td colspan="6"></td></tr>
</table>

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	
Location of building	
Year of completion	
Total square area in m^2	
Identification of building	
Location of building	
Year of completion	
Total square area in m^2	

3.2. List of teachers and associate teachers

CODE	Course	Teachers and associate teachers
	List the courses in alphabetical order	
FELP24	Algorithms and data structures	Linda Vicković, Ph.D., Associate Professor Ivica Crnjac, Teaching Assistant
FEMY02	Applied mathematics	Ivančica Mirošević**,** M.Sc.E.E. Lea Dujić
FELP02	Basic electronics	M.Sc. Spomenka Bovan
FELP16	Computer and data security	Julije Ožegović, Ph.D., Full Professor Sartori Lada Vesa Pekić, Ph.D. Ante Kristić, Ph.D.
FELP04	Computer architectures	Sven Gotovac, Ph.D., Full Professor Dunja Gotovac, Teaching Assistant
FELP08	Computer networks	Stipe Braica Mario Mornar Vesna Pekić, Ph.D. Ante Kristić, Ph.D.
FELP22	Databases	Vladan Papić, Ph.D., Full Professor Tea Marasović, Ph.D., Assistant Professor
FELP15	Databases 2	Eugen Mudnić, Ph.D., Assistant Professor
FELP17	Designing and using computer networks	Julije Ožegović, Ph.D., Full Professor Sartori Lada Vesa Pekić, Ph.D. Ante Kristić, Ph.D.
FELO11	Digital techniques	Julije Ožegović, Ph.D., Full Professor Stipe Braica Vesa Pekić, Ph.D. Ante Kristić, Ph.D.
FENP02	Electrical engineering	Vicko Dorić, Ph.D., Associate Professor Ivana Zulim, Ph.D.

FEOP02	English language 1	Mira Braović Plavša, Senior Lecturer
FEOP03	English language 2	Mira Braović Plavša, Senior Lecturer
FEYY01	Final thesis	
FELP23	Internet programming	Ljiljana Šerić, Ph.D., Assistant Professor Marin Bugarić, Ph.D. Andrija Sommer, mag.ing.
FELP28	Introduction to 3D game programming	Jadranka Marasović, Ph.D., Full Professor Tea Marasović, Ph.D., Assistant Professor
FESP01	Introduction to computer science	Goran Petrović, Ph.D., Associate Proffesor Juraj Alojzije Bosnić, Teaching asistant
FELP26	Introduction to distributed information systems	Ljiljana Šerić, Ph.D., Assistant Professor Maja Braović, Ph.D.
FESY02	Introduction to entrepreneurship	Marija Šiško Kuliš, Ph.D., Associate Professor
FEMY03	Mathematics	mr. sc. Ivančica Mirošević Lea Dujić, Marija Čatipović, Marina Mandić
FELP20	Microcontroller guided mobile robots	Mirjana Bonković, Ph.D., Full Professor Vladan Papić, Ph.D., Full Professor Ivo Stančić, Ph.D., Assistant Professor
FELP19	Mobile communication networks	Dinko Begušić, Ph.D., Full Professor Maja Stella, Ph.D., Assistant Professor Ante Dagelić, Mag. Ing Marina Rajič, Mag. Ing. Josip Žilić, Mag. Ing.
FELP12	Multimedia networks and systems	Mladen Russo, Ph.D., Assistant Professor Jelena Čulić, mag. ing. Martina Bašić, mag. ing.
FELP10	Object-oriented programming	Toni Jakovčević, Ph.D., Assistant Professor
FELP09	Operating systems	Sven Gotovac, Ph.D., Full Professor Petra Lončar, Teaching Assistant
FELP13	PC Arhitecture	Eugen Mudnić, Ph.D., Assistant Professor
FEYY03	Professional Training	
FELP21	Programming 1	Josip Musić, Ph.D., Assistant Professor Andrija Sommer, mag. ing.comp. Davor Rakočević, mag. ing. comp.
FELP03	Programming 2	Linda Vicković, Ph.D., Associate Professor Ivica Crnjac, Teaching Assistant
FELP29	Programming for android	Toni Jakovčević, Ph.D., Assistant Professor
FELP11	Programming in Java	Eugen Mudnić, Ph.D., Assistant Professor
FELP07	Programming in the UNIX environment	Krstinić Damir, Ph.D., Associate Professor
FELP25	Software engineering	Linda Vicković, Ph.D., Associate Professor
FELP27	System analysis and design	Maja Štula, Ph.D., Full Professor
FELP14	Windows programming	Maja Štula, Ph.D., Full Professor

3.3. Curriculum vitae of the course teacher

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
GENERAL INFORMATION ON COURSE 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 EMPLOYMENT	
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 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)	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	D.Begušić: " Mobile communication networks ", handouts, 2016. D.Begušić: "Optical communications ", handouts, 2014. D.Begušić: " Programsko inženjerstvo u telekomunikacijama", nastavni tekst, 2004. 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.
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, "*Heuristic Algorithms for Optimization of Energy Consumption in Wireless Access Networks*", 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:"*Bolonjski proces na Fakultetu elektrotehnike, strojarstva i brodogradnje u Splitu*", Zbornik sažetaka Obrazovanje inženjera Bolonjski proces 3 godine kasnije, Hrvatska akademija tehničkih znanosti, pp.38-39, Zagreb, 2007.
Professional, science and artistic projects in the field of the course carried out in the last five years (5 at most)	Advanced networking technologies and systems, project FESB Advanced heterogeneous networking technologies, project MZOS 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	**Mirjana Bonković, Ph.D., Full Professor**
The course he/she teaches in the proposed study programme	Microcontroller guided mobile robots
GENERAL INFORMATION ON COURSE 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 of last rank appointment	Full professor, 2016.
Area and field of election into research or art rank	Technical Sciences, Field Electrical engineering
INFORMATION ON CURRENT EMPLOYMENT	
Institution where employed	Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture
Date of employment	01/7/1991
Name of position (professor, researcher, associate teacher, etc.)	Full professor, 2016.
Field of research	3D modelling, robotics, computer vision, optimization
Function	
INFORMATION ON EDUCATION – Highest degree earned	
Degree	PhD
Institution	Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture
Place	Split
Date	10/3/2000.
INFORMATION ON ADDITIONAL TRAINING	
Year	1995
Place	Oxford, UK
Institution	Robotics Research Group
Field of training	Robot production lines optimization
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 (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)	Computers and Programming, Undergraduate study program Programming, Undergraduate professional study program Biomimetic systems, Postgraduate study program Vision based modelling and control, Postgraduate study program Elements of robotics, Undergraduate professional study program Microcontrollers and embedded network systems, Graduate study program

Authorship of university/faculty textbooks in the field of the course	Zbirka riješenih zadataka iz programiranja u Cu, upute za laboratorijske vježbe, Interna skripta, FESB Split 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)	1. Kuzmanić 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 2. 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). 3. 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). 4. 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). 5. 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).
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)	Provjera inovativnog koncepta, Alarm astmatičnog napada, projekt HAMAG-BICRO, agencija za malo gospodarstvo, inovacije i investicije., 2014. /2015. "Virtual CulTourist - Razvoj korisničkog sučelja za virtualno predstavljanje kulturne baštine kroz integraciju inovativnih 3D tehnologija", 2016-2017. Programa tehnološkog razvoja, istraživanja i primjene inovacija (2014.-2017.), SDŽ "Napredne metode 3D virtualizacije – na putu prema virtualnom turizmu i digitalizaciji splitske kulturne baštine", 2015-2016. Programa tehnološkog razvoja, istraživanja i primjene inovacija (2014.-2017.), SDŽ
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	**Spomenka Bovan, M.Sc.E.E.**
The course he/she teaches in the proposed study programme	Basic electronics
GENERAL INFORMATION ON COURSE TEACHER	
Address	Split, Trondheimska 4d
Telephone number	+385 21 305 697
E-mail address	spomenka.bovan@fesb.hr
Personal web page	
Year of birth	1960
Scientist ID	154920
Research or art rank, and date of last rank appointment	
Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment	Senior lecturer 17.04.2013.
Area and field of election into research or art rank	Technical sciences, electrical engineering
INFORMATION ON CURRENT EMPLOYMENT	
Institution where employed	Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture
Date of employment	22.04.1987.
Name of position (professor, researcher, associate teacher, etc.)	Senior lecturer
Field of research	Electronics
Function	
INFORMATION ON EDUCATION – Highest degree earned	
Degree	M. Sc.
Institution	Faculty of Electrical Engineering
Place	Zagreb
Date	27.02.1992.
INFORMATION ON ADDITIONAL TRAINING	
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 (3)
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	German (2)
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)	Electronic devices, Professional study programme, 2nd semester Electronic circuits, Professional study programme, 3rd semester Basic electronics, Professional study Programme, 2nd semester
Authorship of university/faculty textbooks in the field of the course	1. S. Bovan: *Osnove elektronike – autorizirana predavanja*, e-learning portal FESB

	2. S. Bovan: *Elektronički elementi – Repetitorij s laboratorijskim vježbama*, Veleučilište u Splitu, 2000. 3. S. Bovan, I. Marasović: *Poluvodički elektronički elementi – upute za laboratorijske vježbe*, autorizirana skripta, FESB, Split 4. S. Bovan: *Elektronički sklopovi – Upute za laboratorijske vježbe,*autorizirana skripta, FESB, Split
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	
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)	4,3

First and last name and title of teacher	**Mira Braović Plavša senior lecturer**
The course he/she teaches in the proposed study programme	English Language1, English Language 2 for students of Electrical Engineering, Mechanical Engineering, Computer Science, Naval Architecture
GENERAL INFORMATION ON COURSE TEACHER	
Address	Nazorov prilaz 22, 21000 Split
Telephone number	00385915052155
E-mail address	plavsabm@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 date of last rank appointment	Senior lecturer 19.2.2014.
Area and field of election into research or art rank	Humanities, Philology
INFORMATION ON CURRENT EMPLOYMENT	
Institution where employed	V. Grammmar School Vladimir Nazor
Date of employment	
Name of position (professor, researcher, associate teacher, etc.)	teacher
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 TRAINING	
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 language 5
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	Italian language 5
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)	English language for special purposes (Facultyof Philosophy Split) English for special purposes (Art Academy Split)

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)	(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?	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	**Vicko Dorić, Ph.D., Associate Professor**
The course he/she teaches in the proposed study programme	Electrical engineering
GENERAL INFORMATION ON COURSE TEACHER	
Address	Matoševa 1, Split
Telephone number	021305694
E-mail address	vdoric@fesb.hr
Personal web page	https://nastava.fesb.hr/nastava/nastavnici/detalji/vdoric
Year of birth	1974.
Scientist ID	248744
Research or art rank, and date of last rank appointment	higher scientific collaborator, February 2013.
Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment	Associate Professor, September 2016.
Area and field of election into research or art rank	Technical sciences, Electrical Engineering, Radio communications
INFORMATION ON CURRENT EMPLOYMENT	
Institution where employed	Faculty of Electrical Engineering, Mechanical Engineering and 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
INFORMATION ON EDUCATION – Highest degree earned	
Degree	Phd
Institution	Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture
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 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 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	1. Poljak, D., Dorić, V., Antonijević S.: Modeliranje žičanih antena primjenom računala, Kigen, Zagreb, 2009. D.Poljak N.Kovač, V. Dorić, Numeričke metode u elektrotehnici – interna skripta, FESB-Split 2006.
Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)	1. D.Čavka, D. Poljak, V. Dorić, R. Goić, Transient analysis of grounding systems for wind turbines, Renewable energy, 43, 2012 2. 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 3. 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. 4. 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. 5. V. Dorić, D. Poljak, K. El Kamichi Drissi, Human Exposure to Outdoor PLC System, PIERS 2011 Marrakesh Progress In Electromagnetics Research Symposium, 2011.
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 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?	
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	**Sven Gotovac, Ph.D., Full Professor**
The course he/she teaches in the proposed study programme	Computer architectures Operating systems
GENERAL INFORMATION ON COURSE TEACHER	
Address	Đorđićeva 5, 21000 Split
Telephone number	+385 21 305850
E-mail address	sven.gotovac@fesb.hr
Personal web page	www.fesb.hr
Year of birth	1960
Scientist ID	108173
Research or art rank, and date of last rank appointment	Scientific Adviser/2004.
Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment	Senior Full Professor/2009.
Area and field of election into research or art rank	Technical Sciences, Field Electrical engineering
INFORMATION ON CURRENT EMPLOYMENT	
Institution where employed	Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture
Date of employment	December, 1983
Name of position (professor, researcher, associate teacher, etc.)	Professor
Field of research	Computer architecture, Implementation of Computer Vison Algorithms on Advanced Computer Architecture.
Function	Head of Chair of Computer Architecture and Operating Systems, Dean of Faculty
INFORMATION ON EDUCATION – Highest degree earned	
Degree	PhD
Institution	Tehnical University Berlin, Germany
Place	Berlin, Germany
Date	24.5.1994.
INFORMATION ON ADDITIONAL TRAINING	
Year	From 2004.
Place	CERN, Genève, Switzerland
Institution	Genève, Switzerland
Field of training	Distributed Computer Architecture
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 4
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	Italian 3
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)	Digital circuits Impulse electronics

Authorship of university/faculty textbooks in the field of the course	Elektronički sklopovi, P.Slapničar, S. Gotovac, FESB, Split 2000. Osnovni elektronicki poluvodički elementi, I. Zulim, S. Gotovac., FESB, Split 1998.
Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)	1. Vicković, Tomislav. Razvoj i realizacija digitalnog uređaja za mjerenje jakosti treperenja napona/znanstveni magistarski rad. Split : Fakultet elektrotehnike, strojarstva i brodogradnje, 08.11. 2010, 161 str. Voditelj: Gotovac, Sven. 2. Vicković, Linda; Mudnić, Eugen; Gotovac, Sven. Parity information placement in the disk array model. //COMPEL: The International Journal for Computation and Mathematics in Electrical and Electronic Engineering. 28 (2009) , 6; 1428-1441
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)	1. ALICE experiment CERN, Modelling of the distributed computing system for storage and retrieval of mass data for high energy physics. – HPC Systems. International scientific project since 2004. 2. Computing system of the University of Mostar.
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	Special award for the development of the University of Mostar Award for Scientific Achievements from University of Split
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)	4.7/5

First and last name and title of teacher	**Toni Jakovčević, Ph.D., Assistant Professor**
The course he/she teaches in the proposed study programme	Object-oriented programming Programming for android
GENERAL INFORMATION ON COURSE TEACHER	
Address	Getaldićeva 25, Split
Telephone number	0914305832
E-mail address	toni.jakovcevic@fesb.hr
Personal web page	http://laris.fesb.hr/toni.htm
Year of birth	1982
Scientist ID	292313
Research or art rank, and date of last rank appointment	Scientific associate, March 2014.
Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment	Assistant professor, May 2014.
Area and field of election into research or art rank	Technical sciences, Field: Computer science
INFORMATION ON CURRENT EMPLOYMENT	
Institution where employed	Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture
Date of employment	2007.
Name of position (professor, researcher, associate teacher, etc.)	Professor
Field of research	Computer science, Artificial intelligence
Function	
INFORMATION ON EDUCATION – Highest degree earned	
Degree	Ph.D.
Institution	Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture
Place	Split, Croatia
Date	10.1.2011.
INFORMATION ON ADDITIONAL TRAINING	
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)	
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	
Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)	1. Bugarić, Marin; Jakovčević, Toni; Stipaničev, Darko. Adaptive Estimation of Visual Smoke Detection Parameters Based on Spatial Data and Fire Risk Index. // Computer vision and image understanding. 118 (2014) ; 184-196 2. Jakovčević, Toni; Stipaničev, Darko; Krstinić, Damir. Visual spatial-context based wildfire smoke sensor. // Machine vision and applications. 24 (2013) , 4; 707-719 3. Bugarić, Marin; Jakovčević, Toni; Stipaničev, Darko. Computer Vision Based Measurement of Wildfire Smoke Dynamics. // Advances in Electrical and Computer Engineering. 15 (2015) , 1; 55-62 4. Stipaničev, Darko; Bugarić, Marin; Krstinić, Damir; Šerić, Ljiljana; Jakovčević, Toni; Braović, Maja; Štula, Maja. New generation of automatic ground based wildfire surveillance systems // Advances in forest fire research. Coimbra, Portugal : Imprensa da Universidade de Coimbra, 2014. 1455-1466 5. Stipaničev, Darko; Šerić, Ljiljana; Braović, Maja; Krstinić, Damir; Jakovčević, Toni; Štula, Maja; Bugarić, Marin; Maras, Josip. Vision Based Wildfire and Natural Risk Observers // Proc. of 3rd International Conference on Image Processing Theory, Tools and Applications, OS1: Special session on Image Processing for Natural Risks (IPNR) / Khalifa Djemal (France), Mohamed Deriche (KSA), Istanbul, 2012. P271
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)	AgISEco – Agent-oriented intelligent systems for environmental survaillance and protection
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	**Damir Krstinić, Ph.D., Associate Professor**
The course he/she teaches in the proposed study programme	Programming in the UNIX environment
GENERAL INFORMATION ON COURSE TEACHER	
Address	Slobode 43, Split 21000
Telephone number	+385 (0) 21 305 895
E-mail address	damir.krstinic@fesb.hr
Personal web page	http://www.fesb.hr/~dkrst
Year of birth	1975
Scientist ID	248812
Research or art rank, and date of last rank appointment	senior research associate, 2011.
Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment	Associate professor, 25. 01. 2017.
Area and field of election into research or art rank	Computer science, Information systems
INFORMATION ON CURRENT EMPLOYMENT	
Institution where employed	FESB, University of Split
Date of employment	01. 02. 2000.
Name of position (professor, researcher, associate teacher, etc.)	Associate professor
Field of research	Computer science
Function	Associate professor
INFORMATION ON EDUCATION – Highest degree earned	
Degree	dr. sc.
Institution	FESB, University of Split
Place	Split
Date	2008.
INFORMATION ON ADDITIONAL TRAINING	
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 (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)	

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)	1. Krstinić, Damir; Kuzmanić Skelin, Ana; Milatić, Ivan, Laser Spot Tracking Based on Modified Circular Hough Transform and Motion Pattern Analysis, Sensors, Vol. 14, no. 11, 2014., pp. 20112-20133 2. Jakovčević, Toni; Stipaničev, Darko; Krstinić, Damir, "Visual spatial-context based wildfire smoke sensor", Machine vision and applications (ISSN 1387-8092), Vol. 24(2013), No. 4, pp. 707-719, 2013. 3. Šerić, Ljiljana; Krstinić, Damir; Braović, Maja; Milatić, Ivan; Mirčevski, Aljoša; Stipaničev, Darko, "Holonic Multi Agent System for Data Fusion in Vehicle Classification", in Proc. Of 10th KES International Conference, KES-AMSTA 2016.; pp-151-161; Puerto de la Cruz, Tenerife, Spain, June 15. - 17. 2016. 4. Stipaničev, Darko; Šerić, Ljiljana; Krstinić, Damir; Bugarić, Marin, "Wildfire video observers network with phyisical an d virtual sensors", 10th EARSel Forest Special Interest Group Workshop – Sensors, Multi-Sensor Integration, Large Volumes: New Oportunities and Chalenges in Forest Fire Research, Limassol, Cyprus, November 2. - 5. 2015. 5. Štula, Maja; Krstinić, Damir; Šerić, Ljiljana, "Intelligent forest fire monitoring system", Information System Frontiers (ISSN 1387-3326), Vol. 14(2012), No. 3; pp- 725-739, 2012.
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 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)	• 2016/2017 - overall average 4.7 • 2015/2016 - overall average 4.8 • 2014/2013 - overall average 4.7 • 2013/2014 - overall average 4.7 • 2012/2013 - overall average 4.7

First and last name and title of teacher	**Jadranka Marasović, Ph.D., Full Professor**
The course he/she teaches in the proposed study programme	Introduction to 3D programming
GENERAL INFORMATION ON COURSE 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 last rank appointment	Senior Research Scientist, 09. July 2007.
Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment	Full professor, 01. March 2009.
Area and field of election into research or art rank	Technical science, field of electrical engineering
INFORMATION ON CURRENT EMPLOYMENT	
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, etc.)	Professor
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 TRAINING	
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 (excellent -5)
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	Italian (sufficient-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)	**Undergraduate studies:** • Measurements and Process Control • Industrial Process Control **Graduate studies:** • Automatic Control

	• System Identification) • Process Control Laboratory • Optimization Methods • Operations Research • Automation **Postgraduate study:** • 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	- (autor) Kvantitativno i kvalitativno modeliranje i simuliranje (Quantitative and Qualitative Modelling and Simulation) (ISBN 953-6114-67-4), - (koautor) On-line (web) udžbenik, Informatički projekt MZT-a, http://laris.fesb.hr/digitalno_vodjenje (Digital Control) - (autor) Predavanja iz kolegija Metode optimizacije (Lessons for Optimizaion Methods) (FESB, e-learning). - (autor) Predavanja iz kolegija Modeliranje i simuliranje sustava (Lessons for Modelling and Simulations) (FESB, e-learning).
Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)	- 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. - **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. - 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.
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)	Associated member in scientific projects: - Računalna inteligencija za prepoznavanje i potporu ljudskih aktivnosti (RIPrePAkt), - GRS Front End Electronics Characterization for LISA, - Agentski orijentirani inteligentni sustavi za nadzor i zaštitu okoliša (Agents Oriented Intelligent Systems for Environment Control and Protection), - Inteligentni agenti u modeliranju i vođenju kompleksnih sustava (Intelligent Agents used for Complex Systems Modelling and Control), - Vođenje složenih sustava inteligentnim metodama (Intelligent Methods for Complex Systems Control).
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	**M.Sc. Ivančica Mirošević**
The course he/she teaches in the proposed study programme	Applied mathematics 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	
Year of birth	1973
Scientist ID	248845
Research or art rank, and date of last rank appointment	
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	FESB, Split
Date of employment	2001
Name of position (professor, researcher, associate teacher, etc.)	Lecturer
Field of research	Mathematics
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
INFORMATION ON ADDITIONAL TRAINING	
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 (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)	Lecturer of various courses since 2001
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)	
Professional and scholarly articles published in the last five years in subjects of teaching methodology and teaching quality (5 works at most)	• 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).
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	**Eugen Mudnić, Ph.D., Assistant Professor**
The course he/she teaches in the proposed study programme	Databases 2 PC Arhitecture Programming in Java
GENERAL INFORMATION ON COURSE TEACHER	
Address	Vinogradska 41, 21000 Split, HR
Telephone number	+385 21 305848
E-mail address	emudnic@fesb.hr
Personal web page	
Year of birth	1968.
Scientist ID	248856
Research or art rank, and date of last rank appointment	Research scientist, 9/7/2009
Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment	Assistant professor, 19/10/2016
Area and field of election into research or art rank	Technical Sciences, Field - Computing systems
INFORMATION ON CURRENT EMPLOYMENT	
Institution where employed	Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture
Date of employment	01/05/2001
Name of position (professor, researcher, associate teacher, etc.)	Assistant professor
Field of research	High performance computing systems, Discrete event simulations
Function	
INFORMATION ON EDUCATION – Highest degree earned	
Degree	PhD
Institution	Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture
Place	Split
Date	16/07/2007.
INFORMATION ON ADDITIONAL TRAINING	
Year	2005-2007.
Place	Geneva, Switzerland
Institution	CERN
Field of training	Grid computing systems
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 (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)	Introduction to distributed computing systems, Undergraduate study programme
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)	1. Čelar, Stipe; Mudnic, Eugen; Seremet, Zeljko. State-of-the-art of messaging for distributed computing systems / Proceedings of the 27th DAAAM International Symposium / Mostar : Elsevier & DAAAM, 2016. 0298-0307 2. Abelev, B. ...; Antičić, Tome; Gotovac, Sven; Mudnić, Eugen; Planinić, Mirko; Poljak, Nikola; Simatović, Goran; Šuša, Tatjana; Vicković, Linda; et al. Technical Design Report for the Upgrade of the ALICE Inner Tracking System. / Journal of physics. G, Nuclear and particle physics. 41 (2014) ; 087002-1-087002-181 3. Abelev, B. ...; Antičić, Tome; Gotovac, Sven; Mudnić, Eugen; Planinić, Mirko; Simatović, Goran; Šuša, Tatjana; Vicković, Linda; et al. Upgrade of the ALICE Experiment: Letter Of Intent. / Journal of physics. G, Nuclear and particle physics. 41 (2014) ; 87001-1-87001-164. 4.Čelar, Stipo; Vicković, Linda; Mudnić, Eugen. Evolutionary measurement-estimation method for micro, small and medium-sized enterprises based on estimation objects. / Advances in production engineering & management (apem). 7 (2012)
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)	CERN-ALICEexperiment - ALICE collaboration group of University of Split (O2-CWG 3 group).
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)	Programming in Java 5/5 Databases 2 4,4/5 PC Architecture 4,2/5

First and last name and title of teacher	**Josip Musić, Ph.D., Assistant Professor**
The course he/she teaches in the proposed study programme	Programming 1
GENERAL INFORMATION ON COURSE TEACHER	
Address	Ruđera Boškovića 32, Split
Telephone number	+ 385 (0)21 305 829
E-mail address	jmusic@fesb.hr
Personal web page	http://marjan.fesb.hr/~jmusic
Year of birth	1980
Scientist ID	272932
Research or art rank, and date of last rank appointment	Senior research associate (February 2013)
Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment	Assistant professor (July 2014)
Area and field of election into research or art rank	Technical sciences, Electrical engineering
INFORMATION ON CURRENT EMPLOYMENT	
Institution where employed	Faculty of electrical engineering, mechanical engineering and naval architecture, University of Split
Date of employment	September 2014
Name of position (professor, researcher, associate teacher, etc.)	Assistant professor
Field of research	Robotics and automatization
Function	/
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 TRAINING	
Year	2012
Place	Glasgow, Scotland, UK
Institution	School of Computing, University of Glasgow
Field of training	human-computer interaction (HCI), signal processing
Year	2008
Place	Glasgow, Scotland, UK
Institution	Department of Computing, University of Glasgow
Field of training	human-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 (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 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)	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)	. 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) 2. Stančić, Ivo; Musić, Josip; Cecić, Mojmil: “A Novel Low-Cost Adaptive Scanner Concept for Mobile Robots”, Ingenieria e Investigacion, 34 (2014), 3; 37-43 3. Stančić, Ivo; Musić, Josip; Zanchi, Vlasta: “Improved structured light 3D scanner with application to anthropometric parameter estimation“, Measurement, 46 (2013), 1; 716-726 4. 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 5. 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
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)	1. Compressive sensing and super-resolution in surveillance systems based on optical sensors and UAVs, 2015-2017, Bilateral Croatia-Montenegro cooperation, project lead 2. Supervised and unsupervised learning from imbalanced datasets for assistance in movement of persons with low vision, 2014-2015, Bilateral Croatia-Slovenia cooperation, project lead 3. Prototyping a module for automatization of industrial floor scrubbers, 2014-2016, Split-Dalmatia county and Odabir d.o.o., project lead 4. Computer intelligence for classification and support of human activities, 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	/
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	**Julije Ožegović, Ph.D., Full Professor**
The course he/she teaches in the proposed study programme	Computer And Data Security Computer Networks Designing And Using Computer Networks Digital Techniques
GENERAL INFORMATION ON COURSE TEACHER	
Address	Istarska 2, 21000 Split, HR
Telephone number	+385 21 305825
E-mail address	julije.ozegovic@fesb.hr
Personal web page	www.fesb.hr/~julije
Year of birth	1954.
Scientist ID	91795
Research or art rank, and date of last rank appointment	Scientific Advisor, 2008-03-12
Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment	Senior Full Professor, 2013-09-15
Area and field of election into research or art rank	Technical Sciences, Field Electrical engineering
INFORMATION ON CURRENT EMPLOYMENT	
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, etc.)	Professor
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	
Degree	PhD
Institution	Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture
Place	Split
Date	1998-02-27
INFORMATION ON ADDITIONAL TRAINING	
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)	
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)	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

	Computer Networks, Undergraduate study of Computing, 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
Authorship of university/faculty textbooks in the field of the course	Julije Ožegović, Digitalna i mikroprocesorska tehnika, ISBN 953-6806-26-6, Split University, 2000, several editions Julije Ožegović, Digital electronics, Discrete systems and structures, elearning.fesb.hr, updated from 1998 Julije Ožegović, Computer Networks, elearning.fesb.hr, updated from 1998
Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)	Kedžo, Ivan; Ožegović, Julije; Kristić, Ante: Contention Overhead — Adaptive Binary Priority Countdown protocol, SoftCOM 2013, ISBN 978-953-290-043-9 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 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 projects in the field of the course carried out in the last five years (5 at most)	1. Media access mechanism modelling for wireless local networks (MAMM), FESB Split, od 2014. 2. HGCAL - CERN CMS, from 2015.
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.	Me4CataLOgue – Teaching and administrative personnel training
PRIZES AND AWARDS, STUDENT EVALUATION	
Prizes and awards for teaching and scholarly/artistic work	Coauthor of awarded paper - ISCC conference 2013.
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

First and last name and title of teacher	**Vladan Papić, Ph.D., Full Professor**
The course he/she teaches in the proposed study programme	Databases Microcontroller guided mobile robots
GENERAL INFORMATION ON COURSE TEACHER	
Address	Makarska 2, 21000 Split
Telephone number	(021) 305649
E-mail address	vpapic@fesb.hr
Personal web page	www.fesb.hr/~vpapic
Year of birth	1968
Scientist ID	227412
Research or art rank, and date of last rank appointment	Scientific Adviser, 20/4/2010
Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment	Senior Full Professor, 17/12/2015
Area and field of election into research or art rank	Technical Sciences, Field Computer science
INFORMATION ON CURRENT EMPLOYMENT	
Institution where employed	Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture
Date of employment	1/7/20097
Name of position (professor, researcher, associate teacher, etc.)	Professor
Field of research	Computer Vision, Expert Systems
Function	Vice-dean for bussines
INFORMATION ON EDUCATION – Highest degree earned	
Degree	PhD
Institution	Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture
Place	Split
Date	12/2/2002
INFORMATION ON ADDITIONAL TRAINING	
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)	Computers in technical systems (PMF, Informatika i tehnička kultura, Undergraduate study programme, 2002-2009.) Electronics (PMF, Informatika i tehnička kultura, Undergraduate study programme 2002 – 2009.) Systems theory (FESB, EIT, Undergraduate study programme, 2009-) Databases (FESB, Computing, Undergraduate study programme, 2009-)

Authorship of university/faculty textbooks in the field of the course	• V.Papić, Lectures in electronics, University textbook, 2005. (in Croatian) • V. Papić, Computer graphics, Faculty textbook, 2013. (in Croatian)
Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)	1. J. Musić, T. Marasović, V. Papić, I. Orović, S. Stanković, Performance of compressive sensing image reconstruction for search and rescue, IEEE Geoscience and Remote Sensing Letters, Volume 13, Issue 11, November 2016, Pages 1739-1743. 2. J. Musić, I. Orović, T. Marasović, V. Papić, S. Stanković, Gradient Compressive Sensing for Image Data Reduction in UAV Based Search and Rescue in the Wild, Mathematical Problems in Engineering, Volume 2016, 2016. 3. I. Orović, V. Papić, C. Ioana, X. Li, S. Stanković, Compressive Sensing in Signal Processing: Algorithms and Transform Domain Formulations, Mathematical Problems in Engineering, Volume 2016, 2016. 4. T. Marasović, V. Papić, V. Zanchi, LMNN metric learning and fuzzy nearest neighbour classifier for hand gesture recognition, Journal on Multimodal User Interfaces, Volume 9, Issue 3, 27 August 2015, Pages 211-221. 5. T. Marasović, V. Papić, J. Marasović, Motion-based gesture recognition algorithms for robot manipulation, International journal of advanced robotic systems. 12 (2015) , 51; 1-13.
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)	1. »Technology transfer infrastructure in the Croatian Adriatic region« - TTAdria (IPA IIIc), 2013-2015. 2. "Computer intelligence for recognition and support of human activities " (RIPrePAkt) (FESB), 2013-. (lead researcher). 3. „Search and rescue system prototype based on image processing " (FESB - Statim d.o.o.), 2014-. (lead researcher) 4. „Advanced methods of 3D virtualization – towards virtual turism and digitalization of cultural heritage“ (FESB – Neir d.o.o.), 2015-. (researcer). 5. International bilateral project Croatia- ”Compressive sensing and superresolution in surveillance systems based on optical sensors and UAVs ", Contract with MZOS RH and MZT Republike Crne Gore, 2015-2016. (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	Mentor of best student (Marko Trninić) in field of social and humanistic scienses (annual award HRZZ, 2010).
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)	4.3/5

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 science
GENERAL INFORMATION ON COURSE 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 EMPLOYMENT	
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 TRAINING	
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 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. Measurement and signal processing, Electrical engineering, graduate 2. Process measurement, Electrical engineering, graduate 3. Instrumentation in electrical engineering, Electrical engineering, undergraduate

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)	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. 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)	1. Smart grid metrology infrastructure, HRZZ Research Projects 2015- 2. Extracting electric energy from human body for supplying autonomous biomedical devices and new PVDF transducer optimization, Bilateral Croatian Italian scientific project 2010-2013.
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?	
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	**Mladen Russo, Ph.D., Assistant Professor**
The course he/she teaches in the proposed study programme	Multimedia networks and systems
GENERAL INFORMATION ON COURSE 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 EMPLOYMENT	
Institution where employed	FESB - Split
Date of employment	08.06.2001.
Name of position (professor, researcher, associate teacher, etc.)	Assistant professor
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 TRAINING	
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 (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)	
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)	• 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. • 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?	
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	**Ljiljana Šerić, Ph.D, Assistant Professor**
The course he/she teaches in the proposed study programme	Internet programming Introduction to Distributed Information Systems
GENERAL INFORMATION ON COURSE 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 last rank appointment	Senior Research Associate, 14.02.2013.
Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment	Assistant professor, 02.12.2013.
Area and field of election into research or art rank	Technical sciencies, Computer Science
INFORMATION ON CURRENT EMPLOYMENT	
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, researcher, associate teacher, etc.)	Assistant professor
Field of research	Science and education
Function	Assistant professor
INFORMATION ON EDUCATION – Highest 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 TRAINING	
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 The level of the study programme: Postgraduate study
Authorship of university/faculty textbooks in the field of the course	1) Stipaničev Darko, Šerić Ljiljana. Artificial intelligence. Split, FESB - Internal script, 2012. 2) Bodrožić Ljiljana. Programming languages of artificial intelligence. Split, FESB - Internal script, 2007.
Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)	1) Doko Alen, Štula Maja, Šerić Ljiljana. Improved sentence retrieval using local context and sentence length. Information processing & management, 49 (2013), 6, 1301-1312. 2) Šerić Ljiljana, Stipaničev Darko, Štula Maja. Engineering of holonic multi agent intelligent forest fire monitoring system. AI communications, 26 (2013), 3; 303-316. 3) Šerić Ljiljana, Krstinić Damir, Braović Maja, Milatić Ivan; Mirčevski Aljoša, Stipaničev Darko. Holonic Multi Agent System for Data Fusion in Vehicle Classification. Proceedings of 10th International KES Conference on Agents and Multi-Agent Systems: Technologies and Applications (KES-AMSTA-16). 2016. 4) Stipaničev Darko, Šerić Ljiljana, Krstinić Damir, Bugarić Marin. Wildfire video observers network with physical and virtual sensors. Proceeding of 10th EARSeL Forest Fire Special Interest Group Workshop - Sensors, Multi-Sensor Integration, large Volumes: New opportunities and Challanges in Forest Fire Research, Themistocleous, Kyriacos ; Hadjimitsis, Diofantos; Gitas, Ioannios ; Boschetti, Luigi (ur.). Limassol, Cyprus, 2015. 5) Ukić Nenad, Maras Josip, Šerić Ljiljana. 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)	
Professional, science and artistic projects in the field of the course carried out in the last five years (5 at most)	AgiSeco – Agent Oriented Intelligent Systems for Environement Monitoring and Control, MZOS, 2007-2012 HOLISTIC – Adriatic Holistic Forest Fire Protection , IPA, 2014- in progres Wind Risk Prevention Projekt – ECHO, Civil Protection Automatic vehicle classification based on computer vision and data fusion

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	20 best junior reasearchers, 2013
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	**Marija Šiško Kuliš, Ph.D., Associate Professor**
The course he/she teaches in the proposed study programme	Introduction to Entrepreneurship
GENERAL INFORMATION ON COURSE TEACHER	
Address	Ilijin 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 date of last rank appointment	Associate Professor, May2011.
Area and field of election into research or art rank	Technical sciences, mechanical engineering
INFORMATION ON CURRENT EMPLOYMENT	
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, etc.)	Head of mechanical department at Hydro South
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 TRAINING	
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 foreign language on a scale from 2 (sufficient) to 5 (excellent)	Engleski – 4
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	Njemački - 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)	Entrepreneurship, Professional Study of Mechanical Engineering, Electrical Engineering, University of Split, Department of Professional Studies, • Entrepreneurship in the media, professional study, TV Academy, Split. • Assessment of technological project- Graduate Studies,

	Industrial Engineering, FESB, Split.
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)	•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. • 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.
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	**Maja Štula; Ph.D., Full Professor**
The course he/she teaches in the proposed study programme	System analysis and design Windows programming
GENERAL INFORMATION ON COURSE TEACHER	
Address	R. Boškovića 32, Split
Telephone number	021305852
E-mail address	maja.stula@fesb.hr
Personal web page	http://marjan.fesb.hr/~kiki/moja_stranica.htm
Year of birth	1971
Scientist ID	248946
Research or art rank, and date of last rank appointment	
Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment	Full professor
Area and field of election into research or art rank	Technical Sciences, Computer engineering
INFORMATION ON CURRENT EMPLOYMENT	
Institution where employed	Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture
Date of employment	15.06.1998.
Name of position (professor, researcher, associate teacher, etc.)	Professor
Field of research	
Function	
INFORMATION ON EDUCATION – Highest degree earned	
Degree	PhD
Institution	Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture
Place	Split
Date	06.05.2005.
INFORMATION ON ADDITIONAL TRAINING	
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)	Software engineering , Graduate study in Computing (before Bologna process), Faculty of mechanical engineering and computing, University of Mostar, BIH Internet programming, Undergraduate study in Computing Windows programming, Graduate study in Electronics and

	software 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)	1. Maras, Josip; Šerić, Ljiljana; Štula, Maja; Ukić, Nenad. Combining education, industry, and empirical studies in Software Engineering: an experience report // Proceedings of the 2015 European Conference on Software Architecture Workshops. ACM, 2015. 2. Maras, Josip; Štula, Maja; Crnković, Ivica. Towards specifying pragmatic software reuse // ECSAW '15 Proceedings of the 2015 European Conference on Software Architecture Workshops. 2015. 3. Markić, Ivan; Štula, Maja; Maras, Josip. Intelligent Multi Agent Systems for Decision Support in Insurance Industry // / Biljanović, Petar (ur.). Rijeka : Croatian Society for Information and Communication Technology, Electronics and Microelectronics - MIPRO, 2014. 1368-1373 4. Maras, Josip; Štula, Maja; Carlson, Jan., Generating Feature Usage Scenarios in Client-side Web Applications // International Conference on Web Engineering 2013 / Florian Daniel, Peter Dolog, Qing Li (ur.). 2013. 186-200 5. Stanković, Rade; Štula, Maja., Fault Tolerance through Interaction and Mutual Cooperation in Hierarchical Multi-Agent Systems // Proceedings of the 5th International Conference on Agents and Artificial Intelligence / Filipe, Joaquim ; Fred, Ana (ur.). Portugal : SCITEPRESS – Science and Technology Publication, 2013. 337-344.
Professional and scholarly articles published in the last five years in subjects of teaching methodology and teaching quality (5 works at most)	1. Golčić, Hrvoje; Skelić, Ivana; Štula, Maja. Razvoj, implementacija i korištenje dodataka za osobe s oštećenjem vida u Moodle sustavu, 2015. (brošura). 2. Golčić, Hrvoje; Skelić, Ivana; Štula, Maja. Accessibility Issues Faced By Blind and Visually Impaired Persons in the Field of Studying and Education // Proceedings of CIET 2014 / Plazibat, Bože ; Kosanović, Silvana (ur.).Split : University of Split, 2014. S-187-S-198
Professional, science and artistic projects in the field of the course carried out in the last five years (5 at most)	IPNAS (Inteligentni Protupožarni NAdzorni Sustav) sustav, stručni DICES – Distributed Component-based Embedded Software Systems, UKF Agentski orijentirani inteligentni sustavi nadzora i zaštite okoliša, MZOŠ Let's Study Together, IPA
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	**Linda Vicković, Ph.D., Assocciate Professor**
The course he/she teaches in the proposed study programme	Algorithms and data structures Programming 2 Software engineering
GENERAL INFORMATION ON COURSE TEACHER	
Address	Put sv. Lovre 55d
Telephone number	+385 21 305 849
E-mail address	Linda.Vickovic@fesb.hr
Personal web page	http://marjan.fesb.hr/~linda/
Year of birth	1973.
Scientist ID	242565
Research or art rank, and date of last rank appointment	Scientific associate, 31/3/2011
Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment	Associate Professor, 22/9/2017
Area and field of election into research or art rank	Technical Sciences, Computing
INFORMATION ON CURRENT EMPLOYMENT	
Institution where employed	FESB
Date of employment	1.5.1997.
Name of position (professor, researcher, associate teacher, etc.)	Assistant professor
Field of research	Scientific research and teaching
Function	
INFORMATION ON EDUCATION – Highest degree earned	
Degree	PhD
Institution	FESB
Place	Split
Date	18. 7. 2007.
INFORMATION ON ADDITIONAL TRAINING	
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)	
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)	Data Structures, Undergraduate study programme, Software engineering, Undergraduate study programme,
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)	1. L. Vicković, S. Gotovac, S. Čelar, Simulation-Based Performance Analysis of the ALICE Mass Storage System, International journal of simulation modelling. 15 (2016), 1; 70-82 2. A. Pinjuh, L. Vickovic, D. Cavar, MapReduce-based face detection in images, Proceedings of the 27th DAAAM International Symposium , DAAAM International, 2016. 658-663. 3. S. Čelar, L. Vicković, E. Mudnić, Evolutionary measurement-estimation method for micro, small and medium-sized enterprises based on estimation objects, Advances in production engineering & management (APEM). 7 (2012), 2; 81-92. 4. S. Čelar, M. Turić, L. Vicković, Method for personal capability assessment in agile teams using personal points, 22nd Telecommunications Forum, IEEE, 2014. 1134-1137
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 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)	4.3/5 4.7/5 4.7/5

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

<table>
<tr><td colspan="2">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.</td></tr>
<tr><td colspan="2">Documentation on which the quality assurance system of the constituent part of the University is based:</td></tr>
<tr><td colspan="2">• Regulations on the quality enhancement system of FESB
• Quality Assurance Handbook of the constituent part</td></tr>
<tr><td colspan="2">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.</td></tr>
<tr><td>Evaluation of the work of teachers and part-time teachers</td><td>• Student evaluation of quality of instruction and teaching activities conducted through student survey (printed questionnaires)
• Survey is organised and conducted by the Quality Enhancement Committee of the Faculty (Committee)
• Survey results are processed automatically at the University
• Survey is conducted each semester
• The Committee presents cumulative results of the survey at the sessions of the Faculty Council. The report is published at the Faculty web site.
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.</td></tr>
<tr><td>Monitoring of grading and harmonization of grading with anticipated learning outcomes</td><td>Committee for study programmes in Undergraduate vocational study in 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</td></tr>
</table>

	are accountable to the Faculty Council.
Evaluation of availability of resources (spatial, human, IT) in the process of learning and instruction	• Student evaluation of work performance of administrative and supporting services, learning infrastructure and student life is conducted through e-survey • Evaluation is conducted using an on-line questionnaire which the students complete in each year of study, except the final year • Survey is organised by the Quality Enhancement Centre of the University of Split, and is implemented by the Quality Enhancement Committee of the Faculty (Committee) • Survey results are processed automatically at the University • Survey is conducted every year • Survey results are presented at the Faculty Council sessions and published at the Faculty web site.
Availability and evaluation of student support (mentorship, tutorship, advising)	• Administrative and supporting services are available to students to provide support in their study activities • Supervisors/ mentors are appointed for students' final papers and diploma thesis
Monitoring of student pass/fail rate by course and study programme as a whole	• Analysis of student pass rate by courses and study programmes is carried out once a year • Analysis of pass rate by study programmes is carried out by the University in cooperation with the Committee • Analysis by courses and study programmes is carried out by the Faculty Management Board • Results of both analyses are presented at the Faculty Council sessions and published at the Faculty web site.
Student satisfaction with the programme as a whole	• Student evaluation of work performance of administrative and supporting services, learning infrastructure and student life is conducted through e-survey • Evaluation is conducted using an on-line questionnaire which the students complete following the completion of studies • Survey is organised by the Quality Enhancement Centre of the University of Split, and is implemented by the Quality Enhancement Committee of the Faculty (Committee) • Survey results are processed automatically at the University • Survey results are presented at the Faculty Council sessions and published at the Faculty web site.
Procedures for obtaining feedback from external parties (alums, employers, labour market and other relevant organizations)	• Once every month, the Faculty Management Board meets with the alumni representatives • Once a year, during the annual FESB anniversary event, round tables and workshops are organised with representatives of employers and other stakeholders
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	• Internal audit of the quality assurance system is conducted once every year • Self-evaluation is carried out every 5 years All the procedures are conducted in line with the Quality Assurance Handbook of FESB.
Description of procedures for informing external parties on the study programme (students, employers, alums)	• All information are available through the Faculty web site: https://www.fesb.hr • Visits to the faculty are organised for high-school students from Split and the wider region • Participation at University fairs • Public media presentations