U N I V E R S I T Y O F S P L I T

FACULTY OF ELECTRICAL ENGINEERING, MECHANICAL ENGINEERING AND NAVAL ARCHITECTURE

DETAILED PROPOSAL OF THE STUDY PROGRAMME

GRADUATE UNIVERSITY STUDY IN INDUSTRIAL ENGINEERING

SPLIT, July 2017

CONTENTS

GENERAL INFORMATION OF HIGHER EDUCATION INSTITUTION

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

Name of the study programme	INDUSTRIAL ENGINEERING		
Provider of the study programme	FACULTY OF ELECTRICAL ENGINEERING, MECHANICAL ENGINEERING AND NAVAL ARCHITECTURE		
Other participants	FACULTY OF ECONOMICS IN SPLIT		
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	Master of Industrial Engineering; mag. ing. industr.		

1. INTRODUCTION

1.1. Reasons for starting the study programme

Putting focus on the market, i.e. producing for a known buyer has become the most important factor for ensuring the existence and development of a modern company. The market continuously sets requirements for the products of increasing complexity. The company has to, regardless the size and type of its activity, continually adjust to the requirements of the market economy:

- competitiveness – acceptable product price
- accuracy of product delivery
- ensuring the necessary level of product quality, and
- meeting environmental requirements - sustainable development.

In order to meet the above mentioned requirements it is necessary to continually educate experts with new skills and knowledge, i.e. to establish interdisciplinary engineering studies. Abandoning hierarchical, functionally oriented large enterprises resulted in larger demands for professionals with the following qualities: flexibility and creativity, motivation, cooperation and communication. In addition to the professional competence, the engineer of tomorrow should have methodical, computer and social skills.

The spectrum of study programmes at our universities, regarded from the point of view of the industrial sector, is oriented predominantly to specialist study programmes. Croatian faculties traditionally educate good professionals, who successfully solve problems within their professional subject field. However, labour market lacks experts who have the potential to effectively manage interdisciplinary tasks and projects. This expert, who would be the "integrator" and "problem solver", would have an academic title Master of Industrial Engineering. The education would not focus only on the technical and natural sciences, but also on economic and organizational sciences. This was the basic motive for the establishment of study in Industrial Engineering in 2002 at the Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture in Split. Faculty of Economics, University of Split participates in the implementation of this study programme as well.

Traditionally, industrial engineering is an area that is mainly concerned with the organization of work and production, i.e. of the following problems: technological process design, production system design, production planning monitoring, quality control, material handling and engineering systems maintenance. According to information given by the Technische Universität Berlin (www.tu-berlin.de), where this study programme is being held for 60 years, the main activities of modern engineers of industrial management are:

- company organization and design,
- systematic analysis and data processing,
- marketing and sales,
- logistics and economics of materials,
- finance and accounting,

- processing and production,
- research and development,
- personnel services,
- management (company management).

Services of the professionals trained in this area are necessary during the Croatian transition to the market economy. According to the German (www.vdi.de) and the American Society of Mechanical Engineers (www.asme.com) engineers of industrial management, are the most required and the most paid in the industrial enterprises of these countries. Given the fact that this study programme is the only programme of this type at Croatian universities, students who complete graduate study in Industrial Engineering will have great prospects for employment in the aforementioned areas of activity in Croatian industrial and service companies.

The study programme in Industrial Engineering was developed with the aim to enable students to acquire basic theoretical knowledge and practical expertise, and to train them for permanent knowledge acquisition, learning about new technologies and developing managerial skills. In addition, during the course of studies each student develops skills of creative thinking, independent and team work and ability to make business decisions at all levels of decision-making. The teaching process conforms with global and particularly with European trends in higher education and with the needs of the economy, and accordingly, appropriate curricula are created. The study programme in Industrial Engineering is closely related to current scientific achievements in the scientific area of engineering, field of mechanical engineering, and economic sciences. All necessary knowledge and skills are based on current scientific achievements within this area.

Following the completions of studies, the acquired knowledge enables the students to find employment in various sectors, e.g. production, chemical and processing industry, education and academic sectors and in the service industry. 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 developments. Professionals trained at FESB are the founders of a number of companies based on advanced technologies in the Split-Dalmatia County and town of Split.

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

One of the basic tasks of the Faculty is the education of young professionals who will use their knowledge, skills and abilities to become stakeholders in the economic and general development of local and wider community. Having been training leading professionals for more than 55 years, the Faculty successfully accomplished its task, providing necessary staff to participate in the development of economy sectors based on different branches of engineering. The Faculty trained professionals who significantly contributed to economic development in the region, thus supporting the region to initiate and successfully develop high-tech based production activities with its own human resources potential.

1.3. Compatibility with requirements of professional organizations

In Croatia, there is no professional association of industrial engineering.

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

FESB and Faculty of Economics are signatories to a number of cooperation agreements, with the aim of promoting scientific and educational activities, concluded with private enterprises and public organisations, e.g. Ericsson Nikola Tesla, national power company HEP, Split-Dalmatia County, Ministry of Defence, Energy institute "Hrvoje Požar", Croatian Telecom, Croatian academic and research network – CARNet, Brodosplit, Siemens, Microsoft Croatia, HSTec, Solvis, Adria Winch, Transmitters and Communications Ltd, Manas etc. Also, 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

In Croatia, the field of study titled Industrial Engineering and Management is offered at the graduate university study in Mechanical Engineering at the Faculty of Mechanical Engineering and Naval Architecture, University of Zagreb, and Faculty of Engineering in Rijeka.

Considering the fact that the study programme in Industrial Engineering, organized at FESB, is the only such programme in Croatia, comparison is possible only with similar study programmes in the world. However, it should be noted that it is not possible to simply copy similar study programmes, but to take into consideration during the process of curriculum development our specific features regarding the economic situation, anticipated development and the scientific advancements. On the other hand, the curriculum has to ensure the same level of quality offered by reputable foreign universities.

The German name for the study of Industrial Engineering would be Wirtschaftsingenieurwesen Studium. The organisation of the proposed study programme is comparable with related study programmes at higher education institutions from other developed countries:

- Germany (Universität Karlsruhe, Universität Stuttgart, Technische Universität Berlin, Universität Aachen)
- Austria (Technische Universität Wien)

- USA (The University of California at Berkeley, Stafford Business School)
- England (University of London, Imperial College of Science, Technology and Medicine)
- Italy (Faculta di Economia e Comerco Venezia)
- Slovenia (Fakulteta za strojništvo, Maribor).

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

Graduate university study in Industrial Engineering supports the concept of student vertical and horizontal mobility. As far as vertical mobility is concerned, graduate university study in Industrial Engineering is open primarily to the postgraduate study programme in Mechanical Engineering. Furthermore, vertical mobility is possible towards other postgraduate study programmes. As far as horizontal mobility is concerned, graduate university study in Industrial Engineering is open for mobility of students of related studies at all Croatian universities. The comparability of the study programme with similar study programmes enables the students to fulfil a part of their course requirements at other higher education institutions in Croatia or abroad.

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

Graduate university study in Industrial Engineering conforms to the Strategy of the University of Split 2015-2020 (Mission, vision and strategic guidelines). 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.

Graduate university study in Industrial Engineering conforms to the development guidelines of the Faculty, as well as with 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 in the region.

The proposed study programme conforms to 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, which includes the proposed study programme.

1.9. Current experiences in equivalent or similar study programmes

FESB has extensive experience in delivering courses at similar study programmes. Faculty of Electrical Engineering in Split was established in 1960, implementing a 2nd level study programme in electrical engineering, with programme duration of 8 semesters. The Centre for part-time study in mechanical engineering was closed in 1965 and replaced by the Mechanical Technology Department, which was founded at the Faculty of Electrical Engineering in Split, providing the two first years of study in Mechanical Engineering. The study programme provided an opportunity for continuing the study programme in Zagreb after the fourth semester. Integration of the studies in electrical engineering, mechanical engineering and naval architecture in 1971 resulted in founding of the Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture – FESB, constituent of the University of Split since 1974. The four-year undergraduate study in Mechanical Engineering, with its own curriculum, was finally completed in 1976. The first two years of study in Naval Architecture were established in 1968 offering students a possibility to continue education at corresponding faculties at the University of Zagreb and University of Rijeka.

The Faculty has implemented professional studies (level VI in former qualifications system) since 1979 until today, with hiatus during the period 1998-2001.

Undergraduate study programmes in Industrial Engineering and Computing at FESB were first introduced in 2002.

At the end of 2004, the activities within the framework of the Bologna Process and harmonisation of the higher education system in Europe become more intensive. Within the Bologna Process, in 2005 the Faculty introduced new study programmes at undergraduate and graduate levels. The following five undergraduate study programmes were established: Naval Architecture, Electrical Engineering and Information Technology, Industrial Engineering, Computing and Mechanical Engineering. Furthermore, the following seven graduate study programmes were established: Automation and Systems, Electronics and Computer Engineering, Electrical Engineering, Communication and Information Technology, Industrial Engineering, Computing and Mechanical Engineering.

In 2006 two postgraduate study programmes were established: Electrical Engineering and Information Technology and Mechanical Engineering. Students who complete graduate study in Industrial Engineering can continue studying at postgraduate doctoral study in Mechanical Engineering with following areas of academic development: machine elements, energy and process engineering and environment protection, machine technologies and materials, industrial engineering and management, marine technology.

Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture and Faculty of Economics, University of Split participate in the implementation of graduate study in Industrial Engineering.

Faculty of Economics is the successor of organized study of economic sciences and of scientific research activities that are present in this region for the past 39 years. The original motives are associated with desires to provide education to economic experts in Dalmatia thus enabling modern development. In addition, the aim was to establish a core institution for scientific research and the place of transfer of new knowledge to economic operators active in this important geographical and economic area.

Early developments of economic sciences in Split started back in 1960, when School of Economics was established. Scientific-research activities were intensified in 1965 with the founding of the Institute for the maritime, tourism and coastal economies. The need for increase in the number of educated graduated economists in 1971 encouraged the Faculty of Economics in Zagreb to establish its distant location study programme in Split. Due to rapid completion of personnel, organizational, physical and other conditions, after two years, the study programme grew into an independent university organization. In 1975 the above mentioned Institute integrated with the Faculty and in 1978 also the School of Economics, after breaking productive educational and scientific connections with Faculty of Foreign Trade in Zagreb. Since then, all three institutions act as a single one, educating professionals and offering two-year and four-year study programmes, developing scientific research ideas that have become particularly distinguished for research and development of ideas for advancement of the local economy in coastal areas.

Due to the achieved level of development, the Faculty of Economics found its place among respectable educational and scientific institutions, not only in Croatian, but also in international circles.

2. DESCRIPTION OF THE STUDY PROGRAMME

2.1. General information

Scientific/artistic area of the study programme	Engineering sciences
Duration of the study programme	2 years
The minimum number of ECTS required for completion of study	120
Enrolment requirements and admission procedure	Completed undergraduate study programme in Mechanical Engineering or completed other related undergraduate study programme with acquired at least 180 ECTS credits, with possible differential exams.

2.2. Learning outcomes of the study programme

The learning outcomes of the study programme are linked directly with the learning outcomes of individual courses and represent learning outcomes achieved by every student who has completed graduate university study in Industrial Engineering. The learning outcomes are in line with the Law on the Croatian Qualification and are listed as common learning outcomes for both modules. There are also additional learning outcomes depending on the module, the knowledge, skills and the corresponding autonomy and responsibility.

KNOWLEDGE

1. Critically assess and explain possible application of different machine tools intended for material separation processes.
2. Propose and design technological process of making products in a single piece production.
3. Propose and apply the tools and methods of quality assurance. Evaluate (working in teams) Quality Management System.
4. Determine the basic construction and the performance of the internal combustion engine and the compressor
5. Analyse and critically assess the application of renewable energy sources.
6. Design simpler transport systems.
7. Construct complex geometric models using modern computer tools.
8. Select and apply optimization methods in solving engineering problems.
9. Mathematically formulate / model different cases and processes in the field of business management, which can be reduced to linear programming problems and solve the resulting problem of linear programming.

10. Analyse different market cases with which the organization can meet in business, and present the main marketing methods and techniques to solve practical problems related to business.
11. Analyse, identify and comment on the theoretical and practical aspects of the functioning of the Croatian economy.

SKILLS

12. Carry out complex experiments and measurements, analyse and interpret collected data and test results and make conclusions and solution proposals.
13. Use literature, databases and other information sources.
14. Apply acquired knowledge to identify, design and solve the most complex engineering problems.
15. Critically assess and explain possibilities of applied techniques and methods and their limitations.
16. Prepare project documentation and technical reports using modern technology.
17. Give a public oral presentation, prepare a written report and present the results of the project in Croatian and English language.
18. Participate in the work of multidisciplinary national and international teams.

INDEPENDENCY

19. Operate and manage development activities in the unpredictable environmental conditions.
20. Make decisions under conditions of uncertainty.
21. Work in the unpredictable conditions.

RESPONSIBILITY

22. Demonstrate awareness of the impacts of engineering practice on the individuals, society and environment.
23. Assume personal and team responsibility for strategic decision-making and successful implementation and execution of tasks in unpredictable conditions.
24. Demonstrate professional and ethical responsibility in the unpredictable conditions.
25. Adopt and transfer new knowledge and technologies.

ADDITIONAL LEARNING OUTCOMES FOR THE FIELD OF STUDY PRODUCTION MANAGEMENT

1. Critically assess criteria in the selection of macro and micro-location of the production system
2. Design (develop the preliminary design) production system for a single piece production.
3. Critically assess different strategies to maintain technical systems
4. Assess the costs of technical systems maintenance.

5. Analyse management models of supply chain.
6. Prepare technologically oriented investment project.

ADDITIONAL LEARNING OUTCOMES FOR THE FIELD OF STUDY PRODUCT LIFE CYCLE MANAGEMENT

1. Analyse and present phases of the product life cycle.
2. Combine different methods of maintenance and operation management.
3. Manage the life cycle of the product in a relation to functional requirements of the market, the production system and requirements of the environment during exploitation.
4. Plan and manage projects.
5. Present principles of sustainable production.

2.3. Employment possibilities

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. FESB is the only higher education institution in Croatia that delivers university study in Industrial Engineering as an independent study programme. Purpose of the study programme in Industrial Engineering has been confirmed by the number of students who successfully completed their studies and are employed in various sectors of economy. Following the completion of studies, the acquired knowledge enables the students to find employment in all industrial sectors, educational and scientific institutions and service industries. 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. Following the completion of studies, the students acquire an appropriate level of knowledge and skills that enable them to perform professional tasks and provide them with skills necessary for participating in working processes in the field of engineering.

The special importance of this study programme, with regard to the labour market, is that it represents the second stage of the comprehensive two-cycle educational process which results in producing a fully educated expert capable of solving the most complex engineering tasks and participating in scientific research. The demand for experts with these learning outcomes 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 graduate university study programme, graduates may continue their studies at the postgraduate study programme in Mechanical Engineering.

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

Undergraduate university study in Industrial Engineering

2.6. Structure of the study

The study programme is structured per semesters, lasting 4 semesters, two in each academic year. Each semester corresponds to 30 ECTS credits. In the first two semesters, students enrol only mandatory courses. In the second year, the study programme offers two modules:

- Production management,
- Product life cycle management.

In the third semester, students of Production Management enrol three mandatory and three elective courses while students of Product life cycle management, enrol four mandatory and two elective courses.

Study programme is completed after the diploma thesis is completed and defended. Enrolment requirements are shown in tables for each course. Lectures are delivered in groups up to 100 students, auditory exercises and seminars in groups of 30 students, laboratory exercises in groups of 10 students and design exercises in groups of 6 students.

2.7. Guiding and tutoring through the study system

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

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

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

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

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

2.10. Criteria and conditions for transferring the ECTS credits

Transfer or recognition of ECTS credits between related graduate university 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 diploma thesis is acquired 60 ECTS credits.	
Procedure of evaluation of final/diploma exam and evaluation and defence of final/diploma thesis	The diploma thesis is evaluated by the Committee for diploma thesis and the defence is public and held in the presence of the Commission for defence of diploma thesis.	

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	FELM01	Automation	30	0	0	30	0	5
	FETM01	Machine Tools and Systems	30	0	0	30	0	5
	FEEM08	Marketing	30	0	30	0	0	5
	FESM03	Optimization Methods 1	45	0	15	0	0	5
	FETM02	Principles of Manufacturing Process Design	30	0	0	15	15	5
	FESM01	Thermal Machines	30	0	15	15	0	5
	Total		195	0	60	90	15	30
	L = Lectures, S = Seminar, AE = Auditory Exercises, LE = Laboratory Exercises, DE = Design Exercises							
	There are 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	FESM15	Computer Aided Design 2	30	0	0	0	30	5
	FEEM02	Croatian Economy	30	0	30	0	0	5
	FESM05	Optimization Methods 2	45	0	0	15	0	5
	FETL16	Quality Assurance	30	0	15	15	0	5
	FESM04	Rational Use of Energy	30	0	30	0	0	5
	FESM10	Transport Systems	30	0	30	0	0	5
	Total		195	0	105	30	30	30
	L = Lectures, S = Seminar, AE = Auditory Exercises, LE = Laboratory Exercises, DE = Design Exercises							
	There are no elective courses.							

Module: Production management - 271

List of courses								
Year of study: 2.								
Semester: III.								
STATUS	CODE	COURSE	HOURS IN SEMESTER					ECTS
			L	S	AE	LE	DE	
Mandatory	FETM03	Maintenance Management	45	0	15	0	0	5
	FETL05	Plant Layout	30	0	0	15	15	5
	FETL09	Production Management	45	0	30	0	0	5
	Total		**120**	**0**	**45**	**15**	**15**	**15**
Elective		Elective course 1						
		Elective course 2						
		Elective course 3						
	L = Lectures, S = Seminar, AE = Auditory Exercises, LE = Laboratory Exercises, DE = Design Exercises							
	Elective courses are chosen using the shared list of the elective courses for both modules of this study programme. Three elective courses are chosen.							

List of courses								
Year of study: 2.								
Semester: IV.								
STATUS	CODE	COURSE	HOURS IN SEMESTER					ECTS
			L	S	AE	LE	DE	
Mandatory	FEXX02	Diploma Thesis						30
	Total							**30**
	L = Lectures, S = Seminar, AE = Auditory Exercises, LE = Laboratory Exercises, DE = Design Exercises							
	There are no elective courses.							

Module: Product life cycle management - 272

List of courses								
Year of study: 2.								
Semester: III.								
STATUS	CODE	COURSE	HOURS IN SEMESTER					ECTS
			L	S	AE	LE	DE	
	FETM07	Management of PLM Projects	30	0	30	0	0	5
	FESM16	Product Development and Management	30	0	0	30	0	5
	FETM06	Product Lifecycle Management	30	0	30	0	0	5
	FETM08	Sustainable Production	30	0	15	15	0	5
	Ukupno obvezni		**120**	**0**	**75**	**45**	**0**	**20**
Elective		Elective course 1						
		Elective course 2						
	L = Lectures, S = Seminar, AE = Auditory Exercises, LE = Laboratory Exercises, DE = Design Exercises							
	Elective courses are chosen using the shared list of the elective courses for both modules of this study programme. Two elective courses are chosen.							

List of courses								
Year of study: 2.								
Semester: IV.								
STATUS	CODE	COURSE	HOURS IN SEMESTER					ECTS
			L	S	AE	LE	DE	
Mandatory	FEXX02	Diploma Thesis						30
	Total							**30**
	L = Lectures, S = Seminar, AE = Auditory Exercises, LE = Laboratory Exercises, DE = Design Exercises							
	There are no elective courses.							

List of elective courses								
Year of study: 2.								
Semester: III.								
STATUS	CODE	COURSE	HOURS IN SEMESTER					ECTS
			L	S	AE	LE	DE	
Elective	FETL26	Design for Assembly	30	0	0	0	30	5
	FETL08	Economic Treatment of Materials	30	0	0	0	30	5
	FESL33	Evaluation of Industrial Projects	30	0	30	0	0	5
	FETL17	Hydraulic and Pneumatic Systems	30	0	0	15	15	5
	FELM03	Information Systems for PLM	30	0	30	0	0	5
	FEEM07	Human Resources Management	30	0	30	0	0	5
	FEXX06	Professional Training						5
	FESL37	Refrigeration	30	0	30	0	0	5
	FEVM03	Strategic Management	30	0	30	0	0	5
	FESL40	Technical Innovations	30	0	30	0	0	5
	FETL20	Tools and Fixtures	30	0	0	0	30	5
	L = Lectures, S = Seminar, AE = Auditory Exercises, LE = Laboratory Exercises, DE = Design Exercises							

2.13. Course description

NAME OF THE COURSE	AUTOMATION							
Code	FELM01	Year of study	1.					
Course teacher	Jadranka Marasović, Ph. D., Full Professor	Credits (ECTS)	5					
Associate teachers	Josip Eterović, Teaching assistant	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 to: Enable students to understand the importance of automated systems, to comprehend how danger can be potentially poorly designed control systems. Enable students to understand that the system automation is very difficult task but the same developed theory can be used for different fields (technical systems, chemical processes, in economy, medicine etc.). Enable students to acquire basic knowledge on the use of computers as a support for the process control.		
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: 1. describe the importance of automated systems and define the basic concepts of the control theory, 2. apply mathematical models of different systems and to understand their importance for the automated processes design, 3. apply a simulation on a digital computer to support the control theory, 4. calculate the fundamental characteristics of the system by means of appropriate methods of analysis (time and frequency domain), 5. choose the appropriate methods for the synthesis and taking account of the tasks and possibilities of physical performance, 6. solve independently complex tasks of system automation.		
Course content broken down in detail by weekly class schedule (syllabus)	Course content	L or S hours	AE hours
	Introduction: automation tasks, issues and areas of application. System theory. Control. theory Control loop. Systems modeling.	2	0
	System approach to automation. Symbolic models as the basis of systems approach to the automation procedures (quantitative and qualitative)	2	0
	Mathematical models and analysis in time domain. Step function as standard input function. System time domain response.	2	0
	Dynamic systems simulation.	2	0
	Integral convolution. Laplace transform. Transfer function.	2	0
	Transfer function for simple and conplex systems. Blocks algebra.	2	0
	The complex systems analysis. Systems of the first and the second order. The parts of the systems response in time domain: transient part and steady state part.	2	0
	The system analysis: the steady-state error, parameters	2	0

	sensitivity, system stability.		
	The system sysnthesis: regulators, system stabilization, response time improvement.	2	0
	Analysis in the frequency domain. Frequency response and the graphic presentation (Bode). The frequency characteristics of basic and complex systems.	2	0
	Control loop objectives and its characteristics and possible problems with connection of neccesary elements: the adder, the sensors for measurements, the transducers, the controllers Generators of different input functions. delay circuits for ON-OFF operation as an introductory knowledge for understanding PLC.	2	0
	Analog elements (mechanical, electronic systems).Electronic components used for the loop creation. Operation amplifier.	2	0
	Nonlinearity of components of complex systems that is described with static characteristics. which are due to the physical properties of these parts. The differences between the response of the actual system and mathematical model due to such nonlinearity neglection. The application of all the preceding steps in the example of design of automated DC motor.	2	0
	List of laboratory or design exercises		LE or DE hours
	How to translate mathematical models in software language VisSim? The choice of linear simulation elements and their connections.		2
	Testing the influence of discretization time (step size) and the final simulation time (end range) on the quality of simulation results. Transfer function simulation.		2
	The complex systems analysis using transfer funcions and blocks algebra.		2
	The analysis of the first and the second order systems. The parts of the systems response in time domain: transient part and steady state part.		2
	Systems stability.		2
	Control system synthesis.P and PID regulator.		2
	Analysis in the frequency domain. Frequency response and the graphic presentation (Bode).		2
	Simulation of the generators of different input functions. delay circuits for ON-OFF operation, PLC.		2
	Simulation of nonlinear parts of the loop elements: Nonlinerities are described with static characteristics.		2
	Simulation as the helpful part for regulatoed DC motor design.		2
	Seminar essay.		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 ☒ seminar essay (other)
Student responsibilities	Minimum of 70 percent lecture attendance. Completing all the required laboratory exercises.	

Screening student work *(name the proportion of ECTS credits for each activity so that the*	Class attendance	1.5	Research		Practical training	
	Experimental work		Report		Individual work	0.5
	Essay		Seminar essay	1	Laboratory exercises	1

total number of ECTS credits is equal to the ECTS value of the course)	Tests	0.5	Oral exam		(Other)	
	Written exam	0.5	Project		(Other)	

Grading and evaluating student work in class and at the final exam	During semester, there will be two mid-term exams – according to the class schedule. The requirement for the positive grade is the attendance and commitment at the laboratory exercises, minimum of 40 percent correct answers at one mid-term and a final grade is determined with minimum of 50 percent total correct answers. 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.

	Title	Number of copies in the library	Availability via other media
Required literature (available in the library and via other media)	J. Marasović; "Basics Steps of Automatic Control“ (in Croatian: Temeljni postupci u automatici), FESB, Authorized lectures		e-learning portal
	J Božičević J.: "Basics of Automatic Control 1“ (in Croatian: Temelji automatike 1), Školska knjiga, Zagreb, 1990		
	G. Nikolić : "Automatic Control“ (in Croatian: Upravljanje), Školske novine, Zagreb 1996.		

Optional literature (at the time of submission of study programme proposal)	T. Šurina: " (in Croatian: Automatska regulacija), Školska knjiga, Zagreb 1987. B. Novaković: " Methods of Technical Systems Control“ (in Croatian: Metode vođenja tehničkih sistema), Školska knjiga, Zagreb. 1990.
Quality assurance methods that ensure the acquisition of exit competences	- 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
Other (as the proposer wishes to add)	

NAME OF THE COURSE	COMPUTER AIDED DESIGN 2							
Code	FESM15	Year of study	1					
Course teacher	Gojko Magazinović, Ph. D., Full Professor	Credits (ECTS)	5					
Associate teachers	Ivan Pivac, Teaching assistant	Type of instruction (number of hours)	L	S	AE	LE	DE	
			30	0	0	0	30	
Status of the course	Obligatory	Percentage of application of e-learning	50					

COURSE DESCRIPTION

Course objectives	Training students for: - understanding the role and significance of CAD/CAE software in contemporary design and manufacturing systems, - performing engineering calculations using a spreadsheet software, - building geometric models, generating its technical drawings, and performing its static structural analyses using a contemporary CAD system.		
Course enrolment requirements and entry competences required for the course	Completion of Computer Aided Design 1 course		
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	Students will be able to: - solve simple engineering problems by using a spreadsheet tool, - draw a graph by using a spreadsheet tool, - use a computer aided design and analysis tool, - generate geometric models and assemblies of moderate complexity, - link geometric models with spreadsheet analyses, - determine the peak stress and deformation within the simple geometric models.		
Course content broken down in detail by weekly class schedule (syllabus)	Course content	L or S hours	AE hours
	Introduction to a course. Description of an e-learning portal.	2	
	History of computing and computers; computer representation of numbers; engineering calculations; sample workbooks.	2	
	Graphical representation of engineering results.	2	
	Spreadsheet numerical integration.	2	
	Spreadsheet equation solver; systems of equations.	2	
	The environment of CAD software; references; design intent.	2	
	Curve and surface modeling.	2	
	First midterm exam		
	Feature parent-child relationship; model editing.	2	
	Model and section properties; measurements; material definition.	2	
	Degrees of freedom and assemblies; geometric tolerances; surface finishes.	2	
	Analysis as a feature; linking models and analysis.	2	
	Examples of models, analysis, and optimization.	2	
	Structural analysis: h-methods; p-methods; boundary conditions; result analysis.	2	
	Second midterm exam		
	List of laboratory or design exercises		LE or DE hours
	Spreadsheet tool elements; making a simple worksheet; built-in		2

	functions.	
	Absolute and relative cell addressing; complex expressions.	2
	Working with data series; conditional formatting; graphing.	2
	Numerical integration: trapezoidal and Simpson's rule.	2
	Equations; linear systems; nonlinear systems.	2
	Basic modeling; parameters; relations; Project, part I: simple parts.	2
	Curves and surfaces.	2
	Project, part II: advanced parts.	2
	Project, part III: assembly.	2
	Project, part IV: technical drawing.	2
	Analysis feature.	2
	Modeling, analysis, and optimization.	2
	Static structural analysis of simple parts.	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 ☒ computer work
Student responsibilities	Attendance of at least 70% lectures and all design 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	0,8
	Essay		Seminar essay		Computer work	2
	Tests	0,2	Oral exam		(Other)	
	Written exam		Project		(Other)	

Grading and evaluating student work in class and at the final exam	There are two midterm exams during the semester (carried out by using computer and e-learning portal; 90 minutes duration; first exam: five theoretical questions, two numerical and one design problems; second exam: five theoretical questions and three design problems). The final exams attend students that didn't pass the midterm exams. The requirements for passing grade are the fulfillment of student responsibilities and at least 50% points on each midterm exam or the final exam. Grade (in percentage) is determined as follows: Grade(%) = (M1 + M2)/2 where M1 and M2 are the midterm grades. The final grades are: satisfactory (2), grades from 50% to 61%; good (3), grades from 62% to 74%; very good (4), grades from 75% to 87%; and excellent (5), grades from 88% to 100%.

Required literature (available in the library and via other media)	**Title**	**Number of copies in the library**	**Availability via other media**
	G. Magazinović, Bilješke uz predavanja, FESB	-	e-learning portal
	R. Toogood: Creo Parametric 2.0 Tutorial and Multimedia DVD, SDC Publications, Mission, 2013.	1	https://books.google.hr
	B. Plazibat, i drugi: Informatika 1, Sveučilišni studijski centar za stručne studije, Split, 2010.	-	Link at e-learning portal

Optional literature (at the time of	- K. Lee: Principles of CAD/CAM/CAE Systems, Addison-Wesley, Reading, 1999. - C. McMahon, J. Browne: CADCAM: Principles, Practice and Manufacturing

submission of study programme proposal)	Management, Prentice-Hall, Harlow, 1998.
Quality assurance methods that ensure the acquisition of exit competences	- Evaluation of results by the above learning outcomes - Feedback from students via surveys - Institutional and non-institutional evaluations
Other (as the proposer wishes to add)	

NAME OF THE COURSE	CROATIAN ECONOMY						
Code	FEEM02	Year of study	1.				
Course teacher	Željko Mrnjavac, Ph.D., Full Professor Lana Kordić, Ph.D., Assistant Professor	Credits (ECTS)	5				
Associate teachers	Blanka Šimundić, Ph.D.	Type of instruction (number of hours)	L	S	AE	LE	DE
			30	0	30	0	0
Status of the course	obligatory	Percentage of application of e-learning	30 %				

COURSE DESCRIPTION

Course objectives	Training students for understanding of key determinats of Croatian economy and long term Croatian economic developments.
Course enrolment requirements and entry competences required for the course	
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	Students will be able to: - analise, identify and coment teoretical and practical aspects of functioning of Croatian economy - analyze the historical aspects of the development of the Croatian economy, - identify problems and interdependence in the economic structure, - assess the consequences of economic policy and the activities of individual economic entities in the context of the national economy, - compare and identify the specifics of the Croatian economy in the international context, - analyze current economic trends and comment on them in accordance with the theory and practice of international economic;

Course content broken down in detail by weekly class schedule (syllabus)	Course content	L hours
	Review of Economic Development in last 100 years	2
	Demographic capital	2
	Employment, unemployment and wages	2
	Fiscal Policy and Public Debt in Croatia	2
	Monetary Policy in Croatia	2
	Privatization and the underground economy in Croatia	2
	Infrastructure and energy sectors in Croatian economy	2
	Transport and trade	2
	Opportunities for tourism development in Croatia	2
	Agriculture	2
	Industrial Performance in Croatia	2
	Croatian Foreign Trade	2
	Regional Policy in Croatia	2
	Social infrastructure in Croatia	2
	Development, technology and structural changes of the Croatian economy	2

	Course content	AE hours
	Introduction to the course: Role of seminars, review of seminar topics, seminar assignment to each student	2
	Presenting the students' work and discussion on a given topic	2
	Presenting the students' work and discussion on a given topic	2
	Presenting the students' work and discussion on a given topic	2
	Presenting the students' work and discussion on a given topic	2
	Presenting the students' work and discussion on a given topic	2
	Presenting the students' work and discussion on a given topic	2
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	Presenting the students' work and discussion on a given topic	2
	Presenting the students' work and discussion on a given topic	2
	Presenting the students' work and discussion on a given topic	2
	Presenting the students' work and discussion on a given topic	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	80% of atendence and seminar presentation	

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	0,5	Practical training	
	Experimental work		Report	0,5	(Other)	
	Essay		Seminar essay		(Other)	
	Tests	2	Oral exam	0,5	(Other)	
	Written exam	1	Project		(Other)	

Grading and evaluating student work in class and at the final exam	The final exam is in written and oral form (ratio 50:50). Positively evaluated written exam is a prerequisite for the oral part of the exam. During the semester students write two tests and present seminar paper. Seminar work and presentation graded with very good (4) or excellent (5) grade give the additional points to the points achieved at midterm or final exam in the current academic year. Positively evaluated two preliminary exams (minimum of 56% of points is needed to pass the midterm exam) with positively evaluated presentation replaced the entire exam.

Required literature (available in the library and via other media)	**Title**	**Number of copies in the library**	**Availability via other media**
	Selected available scientific articles on specific topics. Course Website		Course Website

	PDF materials from the lectures. Course Website		
Optional literature (at the time of submission of study programme proposal)	- Selected professional and scientific papers		
Quality assurance methods that ensure the acquisition of exit competences	Registering students' attendance and success in carrying out of their duties (lecturer). Monitoring lectures and practice sessions (Vice Dean for Education). Students' Performance analysis in each course (Vice Dean for Education). Student questionnaire on the quality of lecturers and lessons for each course (University of Split, Quality Assurance Centre) Examination is used as an instrument to evaluate individual course outcomes by the course lecturer. The content of exam is reassessed periodically in order to assure - compliance with the course outcomes.		
Other (as the proposer wishes to add)			

NAME OF THE COURSE	DESIGN FOR ASSEMBLY						
Code	FETL26	Year of study	2				
Course teacher	Nikola Gjeldum, Ph.D. Assistant Professor	Credits (ECTS)	5				
Associate teachers	Marina Crnjac, Teaching assistant, Ivan Peko, Teaching assistant	Type of instruction (number of hours)	L	S	AE	LE	DE
			30	0	0	0	30
Status of the course	Elective	Percentage of application of e-learning	0 %				

COURSE DESCRIPTION

Course objectives	Objectives: – Understanding and application of Design for Assembly basic principles – Teach students to design a product with its elements in Siemens NX CAD software – Teach student to design a product taking into account a simplicity and suitability of assembly process	
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 a product elements in Siemens NX CAD software ("part design") – connect designed product elements in assembly ("assembly design") – generate designed product drawings ("drawing") – redesign a product according to assembly process requirements – make an assembly process plan for designed product	
Course content broken down in detail by weekly class schedule (syllabus)	Course content	L hours
	Introduction and basic principles. Historical development of product assembly process	2
	Product architecture	2
	Product design for assembly	2
	Methods of product design for assembly	3
	Measures and tolerances in assembly process	2
	Product design modifications	1
	Assembly process	2
	First midterm exam	2
	Making a plan for manual assembly process	2
	Chart of assembly process traceability	2
	Organizational structures in manual assembly process	2
	Lean methods for assembly processes	2
	Development from primary labor division phase to autonomous working groups	2
	Balancing of assembly process workstations	2
	Second midterm exam	2

	List of design exercises	DE hours
	Introduction in Siemens NX CAD software	2
	Part design in Siemens NX	8
	Assembly design in Siemens NX	10
	Generating product drawings in Siemens NX	4
	Simulation in Siemens NX	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 and exercises in the amount of at least 70 % of the times scheduled.	

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		Individual work	2,7
	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 semester there are two midterm exams. The first midterm exam is after 7 weeks of lecturing and the second one is after the next 6 weeks. In the first two final exams students that did not pass at least one of the midterm exams take part. In the third and fourth final exams students take the whole exam regardless results of midterm exams. The requirements for passing grade are positive assessment of individual project and positive assessment in exam. Positive assessment represents minimal 50% points on each midterm exam or minimal 50% points on final exam. Final exams are conducted in written form. Midterm exams and final exams consist of theoretical questions and numerical problems.

Grade (%) = (D + E) / 2

D – Individual project grade (%)
E – average points achieved on midterm exams expressed as a percentage or number of points achieved on the final exam expressed as a percentage.

E = (M1 + M2)/2
M1, M2 – average points achieved on midterm exams expressed as a percentage.

Grade (%):	Final mark:
50% - 61%	sufficient (2)
62% - 74%	good (3)
75% - 87%	very good (4)
88% - 100%	excellent (5)

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

Title	**Number of copies in the library**	**Availability via other media**
Gjeldum, N.: "Dizajn za montažu", lectures on e-learning, FESB Split		Internet (e-learning)
Marinescu, I., Boothroyd, G.: "Product design for	1	

	manufacture and assembly", Marcel Dekker, New York, 2002.		
	Whitney Daniel E.: "Mechanical Assemblies – Their Design, Manufacture, and Role in Product Development", Massachusetts Institue of Technology, Oxford University Press, 2004.	1	
Optional literature (at the time of submission of study programme proposal)	1. A.J.D.Lambert Surendra M. Gupta: "Disassembly Modeling for Assembly, Maintenance, Reuse, and Recycling", CRC Press, 2000. 2. Molloy, O., Tilley, S., Warman, E.: "Design for manufacturing and assembly – Concepts, architectures and implementation, Springer Science + Bussines Media, 1998. 3. WEB publications on DFA		
Quality assurance methods that ensure the acquisition of exit competences	– keeping records of the attendance of students – annual evaluation of teachers – periodical evaluation of individual project advancement – feedback from students via surveys – self-evaluation of teachers – institutional and non-institutional evaluations		
Other (as the proposer wishes to add)			

<table>
<tr><td>NAME OF THE COURSE</td><td colspan="7">DIPLOMA THESIS</td></tr>
<tr><td>Code</td><td>FEXX02</td><td>Year of study</td><td colspan="5">2</td></tr>
<tr><td>Course teacher</td><td></td><td>Credits (ECTS)</td><td colspan="5">30</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="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,
- being independent in solving problems under the given conditions,
- applying scientific-research and ethical principles,
- writing and presenting the project results.</td></tr>
<tr><td>Course enrolment requirements and entry competences required for the course</td><td colspan="7">Acquired 60 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:
- To consolidate theoretical knowledge and practical skills in solving highly complex engineering problems
- To use literature, databases and other sources of information
- To select appropriate methods and procedures for solving the most complex engineering problems
- To apply scientific and technical knowledge and skills to effectively solve engineering problems
- To apply scientific research methodology and ethical principles in the science
- To give oral 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="7">Diploma thesis is the independent work of the student produced according to the task and instructions given by the supervisor, and according to the scientific research methodology and ethical principles.</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"></td></tr>
<tr><td>Experimental work</td><td></td><td>Report</td><td></td><td>Individual work</td><td colspan="2">30</td></tr>
<tr><td>Essay</td><td></td><td>Seminar essay</td><td></td><td>(Other)</td><td colspan="2"></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</td><td colspan="7"></td></tr>
</table>

<table>
<tr><td>evaluating student work in class and at the final exam</td><td colspan="3">Producing of the diploma thesis is evaluated by the supervisor based on the student's achievements during the process of preparing the diploma thesis. Commission for defence of the diploma thesis gives an assessment, representing an average grade for the preparation and defence of the thesis.</td></tr>
<tr><td rowspan="2">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>1. Etički kodeks Fakulteta elektrotehnike, strojarstva i brodogradnje u Splitu
2. Zelenika, Ratko: Metodologija i tehnologija izrade znanstvenog i stručnog djela, Pisana djela na stručnim i sveučilišnim studijima, knjiga peta, Ekonomski fakultet u Rijeci, Rijeka, 2011.
3. Žugaj, Miroslav; Dumičić, Ksenija; Dušak, Vesna: Temelji znanstvenoistraživačkog rada, Metodologija i metodika, Fakultet organizacije iinformatike, Varaždin, 2006.

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.</td><td></td><td>Web site of the Faculty</td></tr>
<tr><td>Optional literature (at the time of submission of study programme proposal)</td><td colspan="3"></td></tr>
<tr><td>Quality assurance methods that ensure the acquisition of exit competences</td><td colspan="3">- Self-evaluation of teachers
- Student survey of the whole study programme</td></tr>
<tr><td>Other (as the proposer wishes to add)</td><td colspan="3"></td></tr>
</table>

NAME OF THE COURSE	ECONOMIC TREATMENT OF MATERIALS						
Code	FETL08	Year of study	1				
Course teacher	Nedjeljko Mišina, Ph.D., Full Professor	Credits (ECTS)	5				
Associate teachers		Type of instruction (number of hours)	L	S	AE	LE	DE
			30	0	0	0	30
Status of the course	Elective	Percentage of application of e-learning	0				

COURSE DESCRIPTION

Course objectives	Training students to: 1. Introduction to the inventory of raw materials in the world and in our country, and the life cycle of materials 2. Recognizing the phenomenon of fractures and damage to materials 3. Understanding the connection between structure and mechanical properties of materials 4. Presentation of corrosion processes and methods of protection 5. Training for the use of different methods of repair of damaged machine parts and constructions 6. Acquiring the latest knowledge about steels, non-ferrous metals, adhesions, composites, metal foams, solders, polymers, ceramics and wood as a structural material
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: 1. Describe and identify the cause breakage or damage the component or structure 2. To analyze the impact of the structure of materials on the phenomenon of fracture or damage to materials 3. Determine technology repair of the component or structure of some welding processes, welding, soldering or metallization 4. Determine the need for conducting heat treatment in order to relieve the residual stresses, and prescribe technology 5. To demonstrate the testing of mechanical properties of materials using laboratory equipment and testing of welded joints non-destructive methods

Course content broken down in detail by weekly class schedule (syllabus)	Course content	L hours	AE hours
	Distribution of materials and their properties	2	0
	Permanent static strength, aging steel	2	0
	The fragility of failure, brittle fracture	2	0
	Technologicality, economy and exploitability products	2	0
	Technology of structural steel construction	2	0

	Legislation for manufacturing welded structures	2	0
	Repair of machine parts	2	0
	First midterm exam		
	Residual stresses and failure modes	2	0
	Special steels and their application	2	0
	Inventories of raw materials in the world. The life cycle of products and materials	2	0
	Product requirements and criteria for the selection of materials	2	0
	The methodology of choice of materials and the method of election materials in practice	2	0
	The recycling of materials. The problems, costs and effects of recycling.	2	0
	Second midterm exam		

List of laboratory or design exercises	DE
Seminar paper from the choice of materials	5
Recycling of materials	5
Technology of machine parts	5
Repair of machine parts	5
Technology of welded structures	6
First midterm exam	
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 in lectures and exercises in the amount of at least 70%. Performed all required seminar 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		Self-directed learning	3
	Essay		Seminar essay	1	Laboratory exercises	
	Tests		Oral exam		(Other)	
	Written exam		Project		(Other)	

Grading and evaluating student work in class and at the final exam	During the semester there will be two mid-term exams (tests). The first mid-term, after 7 weeks of classes and the second after the next 6 weeks of classes. At the final exam students have to take part material that did not pass the mid-term. Each test is carried out as written exam lasting 45 minutes. The requirements for a positive evaluation are: positive assessment of seminar exercises and 50% points on each test. The final grade is based on the resulting percentage on mid-term exams. Percentage - Rating 50% to 61% - sufficient (2)

<table>
<tr><td></td><td colspan="3">62% to 74% - good (3)
75% to 87% - very good (4)
88% to 100% - excellent (5)
Examinations according to the Faculty schedule!

The final grade is determined after the second final exam, applying the absolute ECTS grading system in accordance with the study rules and study system of the University of Split. Students who did not pass the exam after two final exams have the last chance to pass exam in the autumn period. Overall material has to be passed at last possible exam.The exam lasts 90 minutes.</td></tr>
<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>N. Mišina: the author's lecture, FESB</td><td></td><td></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></td><td></td><td></td></tr>
<tr><td>Optional literature (at the time of submission of study programme proposal)</td><td colspan="3">1. T. Filetin: Izbor materijala I razvoj proizvoda, FSB, Zagreb, 2000.
2. M.F. Ashby: Materials Selection and Mechanical Design, 3rd edition, Butterworth Heinemann, Oxford, 2001.</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	EVALUATION OF INDUSTRIAL PROJECTS						
Code	FESL33	Year of study	5				
Course teacher	Damir Vučina, Ph. D., Full Professor, Željan Lozina, Ph. D., Full Professor Marija Šiško Kuliš, Ph. D., Associate Professor	Credits (ECTS)	5				
Associate teachers	Igor Pehnec, Ph. D., Teaching assistant	Type of instruction (number of hours)	L	S	AE	LE	DE
			30	0	30	0	0
Status of the course	Optional	Percentage of application of e-learning	0				

COURSE DESCRIPTION

Course objectives	The aim of the course is that students acquire knowledge about the impact of revenues, operating costs and capital investment on the cash flows of the project, and about the financial efficiency analysis the projects. Special attention will be paid to methods of evaluation and assessment of the success of the project. The course is designed as a combination of lectures and practical work in which the students, based on practical examples, have the opportunity to analyze the project and learn how to create the process and criteria for making good investment decisions.		
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 the course the students will be able to: - interpret the concept, content and purpose of the development of the investment project - Evaluate of sales and purchase market, possibility to sell their own products or services and projections of revenue, cost and required investment. - Construct the planned financial statements. - Evaluate the justification of investments by using static and dynamic approach to profitability. - Make sensitivity analysis of the project. - Clearly and unambiguously present their own investment project that will support the justification of investment		
Course content broken down in detail by weekly class schedule (syllabus)	Course content	L hours	AE hours
	Introduction to business planning; project, project types	2	2
	Project life cycle	2	2
	Elements of the feasibility study	2	2
	SWOT analysis	2	2
	Technical and technological elements of investment	2	2
	Analysis of material resources	2	2
	Market Analysis, Project risks management	2	2
	First mid-term exam		
	Projection of the income statement, Projection of the financial	2	2

	and economic flow of the project		
	Projection of the balance sheet	2	2
	Static evaluation of the project: Financial indicators	2	2
	Dynamic evaluation of the project: The payback period of the project; Net present value (NPV); Relative net present value (RNPV); Internal Rate of Return (IRR);	2	2
	Calculation of the net present value of the project and the internal rate of return	2	2
	Rating uncertainties of the project: Analysis of profitability threshold and sensitivity analysis of the project	2	2
	Second mid-term 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 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	0.5	Research		Practical training	
	Experimental work		Report		Individual work	
	Essay		Seminar essay		Laboratory exercises	
	Tests	1	Oral exam	0.5	Preparation for laboratory exercises	
	Written exam		Project	3	(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. On the final tests students take a part of teaching materials that did not pass on midterm. Each midterm carried out as oral exams for period of 75 minutes and consists of about 10 questions. Test is based on a project which the students independently write. The requirement for a positive evaluation is a positive evaluation of the self-generated project. The final grade (in percent) is formed according to the formula: Grade(%) = 0,5 (M1 + M2) the activities in percentage: • M1, M2 – midterms test results.

	Title	**Number of copies in the library**	**Availability via other media**
Required literature (available in the library and via other media)	M. Šiško Kuliš: Authorized lectures, FESB		e-learning portal
	M. Šiško Kuliš: Authorized workbook, FESB		e-learning portal
	S. Orsag: Budžetiranje “Kapitala procjena investicijskih projekata”, Masmedia, 2002, Zagreb	0	
Optional literature (at the time of	Financial and Economic Analysis of Development Projects, European Commission Methods and Instruments for Project Cycle Management, Working Team		

submission of study programme proposal)	coordinated by Professor Massimo Florio, Office for Official Publications of the European Communities, Luxembourg, 1997.
Quality assurance methods that ensure the acquisition of exit competences	- Evaluation of results in accordance with the above learning outcomes - Attendance in class tracking - Yearly analysis of the success of the examinations - Feedback from students via surveys - Self-evaluation of teachers - Institutional and non-institutional evaluations
Other (as the proposer wishes to add)	

NAME OF THE COURSE	HUMAN RESOURCES MANAGEMENT					
Code	FEEM07	Year of study	2			
Course teacher	Srećko Goić, PhD, Full Professor	Credits (ECTS)	5			
Associate teachers	Danica Bakotić, PhD, Associate Professor Ivana Tadić, PhD, Assistant Professor	Type of instruction (number of hours)	L	S	E	F
			45	15	30	
Status of the course	Elective	Percentage of application of e-learning	25			

COURSE DESCRIPTION

Course objectives	The aim of the course is to introduce students to the **basic concepts** of human resources management and to its specific features within the overall company's management. The student should be able to organize and carry out various tasks in the field of human resources management within different companies.
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)	GENERAL OUTCOME: 1. Ability to organize and carry out various tasks in the field of human resources management in the companies of all categories and sizes. Specific learning outcomes: 1. To analyze situation and processes in the environment that are important for human resources management in the company 2. To analyze existing systems and practices of human resources management in the company 3. To understand and accept company's strategies and policies of human resources management and transform them in the operative activities 4. Choose, develop and implement effective solutions in particular areas of human resources management 5. Implement accepted organization and policies of human resources management in the company

Course content broken down in detail by weekly class schedule (syllabus)	Contents	Hours L	Hours E
	INTRODUCITON: Definition and contents of human resources management. Position and significance of human resources management within the company's management.	3	2
	Job ANALYSIS AND DESIGN as the basis for human resources management (Work Study, Industrial Engineering, Ergonomics, Workplace Design, Contemporary Practice in Job Designing).	3	2
	PLANNING HUMAN RESOURCES. Human resource planning as part of a company planning system. Time Dimension in Human Resources Planning. Peculiarities of Human Resource Planning.	3	2
	REGRUTING AND SELECTION: Recruitment of personnel (Sources of recruitment, Recruitment methods); Selection of personnel (Concept, content and selection process, Information bases on candidates, Interview, Tests, Decision on candidate selection).	3	2
	TRAINING AND DEVELOPMENT (Introduction to Work, Concept, Content and Characteristics of Training, Training vs. Education, Training Process and Methods, Personnel Development - Career Development).	3	2

	MOTIVATION AND MOTIVATION PROCESSES: Basic Motivation Theories; Motivation, work satisfaction and work performance.	3	2
	PERFORMANCE APPRAISAL AND PERFORMANCE IMPROVEMENT (Concept of Performance, Performance Appraisal Methods, Assessment Methods, Using Results of Performance Appraisal, Performance Improvement).	3	2
	COMPENSATION I: Concept, content and character of compensation. Forms of Compensation. Compensation Policy. Basic salary and its determination. Job Evaluation Methods.	3	2
	COMPENSATION II: Incentive Payments (Principles and Models of Incentive Payment). Fees and supplements. Benefits.	3	2
	RELATIONS BETWEEN EMPLOYEES AND EMPLOYERS: Labor relations (Concept and content, Institutional framework, Starting and termination of employment, Disciplinary actions); Collective labor relations (Trade unions and their activities, Organizations of employers and managers, Collective bargaining and contracting, Collective disputes and strike).	3	2
	PROTECTION AND IMPROVEMENT OF CONDITIONS OF WORK AND LIFE OF EMPLOYEES I: Safety at Work (Objectives and Content, Institutional Framework, Creating Safe Working Environment). Healthcare (Content and Forms, Institutional Framework, Creating a Healthy Environment, Stress Management).	3	2
	PROTECTION AND IMPROVEMENT OF WORKING CONDITIONS AND LIFE OF EMPLOYEES II: Other forms of protection and improvement of the quality of life of employees (Social protection, Protection of employees' rights, Protection of special groups, Leisure and recreation).	3	2
	INFORMATION SYSTEM FOR HUMAN RESOURCES MANAGEMENT: Objectives and Tasks of the Human Resource Management Information System; Basic System Elements (System Components, Functional Components, Subsystems and Structure); Designing the Human Resource Information System (Principles, Users, Types)	3	2
	ORGANIZATIONAL ASPECTS OF HUMAN RESOURCE MANAGEMENT: Human Resource Management Activities; Factors influencing the organization; Levels of organizing human resource management function; Forms of organization of the human resource department(s),	3	2
	FINAL CONSIDERATIONS AND PREPARATIONS FOR THE EXAM.	3	2
	List of seminars		Hours
	Seminar 1: Practical aspects of recruitment, selection and training of staff		3
	Seminar 2: Employee Evaluation (Performance Appraisal)		3
	Seminar 3: Calculation of salary / various variants of incentive payment; calculation of fees and supplements, calculation of contributions, income tax and surtax /		3
	Seminar 4: Practical aspects of employees - employers relations.		3
	Seminar 5: Practical aspects of safety at work		3

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

	☒ field work					
Student responsibilities	Attending lectures and exercises and seminars min. 70%. Preparing and presenting one seminar.					
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		Assignments (Other)	1,5
	Essay		Seminar essay		(Other)	
	Tests	2	Oral exam		(Other)	
	Written exam		Project		(Other)	
Grading and evaluating student work in class and at the final exam	During the semester there will be two tests, which can bring a maximum of 60 points each. The practical part of the exam will be checked through four assignments, which will give students maximum of 100 points. Based on regular attendance and active participation in classes, students can achieve up to 20 points. The student who earned at least 130 points during the course of classes, with at least 3 assignments (and at least 60 points in the assignments) and achieved a total of at least 60 points (and at least 25 points in each test) will have passed the exam and will be offered an appropriate grade. The final exam takes place in a written and / or oral way and contains theoretical and practical elements.					

Required literature (available in the library and via other media)	**Title**	**Number of copies in the library**	**Availability via other media**
	S. Goić, D. Bakotić, I. Tadić: Learning materials, EFST		e-learning portal
	Noe R. A., Hollenbeck, J.R., Gerhart, B., Wright, P.M.: Menadžment ljudskih potencijala, MATE, Zagreb 2006.		

Optional literature (at the time of submission of study programme proposal)	- Bahtijarević-Šiber, F.: Management ljudskih potencijala, Golden marketing, Zagreb, 1999. - Bohlander, W.G., Snell, S.; Sherman, W.A.Jr.. Managing Human Resources, South-West College Publishing, Cincinnati, 2001. - Buble, M.: Management, Ekonomski fakultet Split, Split, 2006. - Ivanchevich, J.M.; Human Resource Management, IRWIN, Chicago, 1994. - Marušić, S.: Upravljanje ljudskim potencijalima, ADECO, Zagreb, 2006.
Quality assurance methods that ensure the acquisition of exit competences	• Classes attendance records • Annual analysis of study success (results) • Student Survey on the Quality of Teachers and Teaching for Each Subject Study (UNIST, Center for Quality Improvement) • The examination conducted by the subject teacher examines all learning outcomes of the subject. Periodic check of the content of the exam is carried out on the basis of which the appropriateness of the methods for checking the acquisition of exit competences is assessed.

Other (as the proposer wishes to add)		

NAME OF THE COURSE	HYDRAULIC AND PNEUMATIC SYSTEMS						
Code	FETL17	Year of study	1				
Course teacher	Jani Barle, Ph. D., Full Professor	Credits (ECTS)	5				
Associate teachers	Alen Kovač, Teaching assistant	Type of instruction (number of hours)	L	S	AE	LE	CE
			30	0	0	15	15
Status of the course	Elective	Percentage of application of e-learning	0				

COURSE DESCRIPTION

Course objectives	Upon completion the student will be introduced to essential features of industrial hydraulic or pneumatic systems. They will be able to draw, explain and assemble schematic diagram and to demonstrate ability to identify hydraulic or pneumatic system elements by symbol and function and to use that skills for fault finding and solving.			
Course enrolment requirements and entry competences required for the course	None			
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	Students will be able to: 1. Present general concepts associated with industrial appliaction of hydraulics and pneumatics. 2. Identify components of the system and draw related symbols. 3. Arrange and assemble simple hydraulic and pneumatic systems. 4. Combine various elements with respect to size and design concept. 5. Critically assess workability and supportability of complex hydraulic and pneumatic systems. 6. Develop hydraulic or pneumatic system.			
Course content broken down in detail by weekly class schedule (syllabus)	Course content	L hours	LE hours	CE hours
	Historical aspect and scope of hydraulics and pneumatics. Introduction to pneumatics. Basic physical principles of pneumatics.	2		
	Typical pneumatic systems demonstrations.		2	
	Compressed air generation and distribution. Standards and Symbols.	2		
	Compressed air generation and distribution.			2
	Basic elements of pneumatic systems (check, pressure control and directional control valves).	2		
	Methods for development of pneumatic systems.			2
	Basic elements of pneumatic systems (directional control valves, valve actuation types, accessories).	2		
	More complex pneumatic circuits (introduction to laboratory exercises).			2
	Basic elements of pneumatic systems (cylinders and motors).	2		
	Circuit assembling on pneumatic didactic table (guided).		2	
	Electric valves and electropneumatic systems. Proportional pneumatics.	2		
	Circuit assembling on pneumatic didactic table.		2	
	Introduction to hydraulics. Basic physical principles of hydraulics, oils and theoretical background. Energy efficiency	2		

	of hydraulic systems. Fundamental hydraulic problems: cleanness, temperature, cavitation - bubble entrainment and evacuation.			
	Typical hydraulic systems demonstrations.		2	
	Hydraulic elements for energy conversion: cylinders, pumps and motors with constant and adjustable displacement.	2		
	Hydraulic elements and their most important parts.		2	
	Basic control elements in hydraulics: check valves, direct acting and pilot operated pressure-relief valves.	2		
	Hydraulic elements and their most important parts.		2	
	Basic control elements in hydraulics: direct acting and pilot operated directional control valves, pressure regulators, flow control valves.	2		
	Hydraulic cylinders - parallel and series circuit. Synchronizing cylinder movement and load.			2
	Typical design solutions of hydraulic elements for energy conversion (cylinders, pumps and motors with constant and adjustable displacement)	2		
	Typical hydraulic circuits: accumulator holding, pump unloading, braking, counter balance. Hydraulic presses.			2
	Pressure control circuits. Flow and speed control circuits.	2		
	Flow control circuits (introduction to laboratory exercises).			2
	Closed flow hydraulic circuits. Load sensing (LS) systems.	2		
	Hydraulic didactic model. Motor speed adjustment with throttle valve. Speed control with two and three-way flow control valves.		2	

Format of instruction	☒ lectures ☐ seminars and workshops ☒ exercises ☐ *on line* in entirety ☐ partial e-learning ☐ field work	☒ individual assignments ☒ multimedia ☒ laboratory ☐ work with mentor ☐ individual project (other)
Student responsibilities	Minimum of 70 percent lecture attendance. Completing all the 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		Preparation for exercises	0,8
	Tests	0,2	Oral exam		(Other)	
	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-week session classes and the second one is after the next 6 weeks. The midterms are carried out as written tests, made up of three questions relating to the basic issues and schematics. The oral exam is focused on the student's interpretation skills. The requirement for passing grade is the positive assessment on each midterm exam (>49%) or the final exam.
The final score is:

$$Score\ (\%) = 0,35 \cdot A_1 + 0,35 \cdot A_2 + 0,20 \cdot A_3 + 0,10 \cdot A_4$$

- *midterm 1:* $A_1 = 50 – 100\ \%$,
- *midterm 2:* $A_2 = 50 – 100\ \%$,
- *oral exam:* $A_3 = 50 – 100\ \%$.

<table>
<tr><td></td><td colspan="3">

- *class attendance: A_4 = 70 – 100 %.*

Score Grade
50% - 62% sufficient (2)
63% - 76% good (3)
77% - 88% very good (4)
89% - 100% excellent (5)
</td></tr>
<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>Barle, J.: Hydraulics and pneumatics, (student handbook and workbook in Croatian: Hidraulika i pneumatika), FESB, Split, 2010.</td><td></td><td>e-learning portal</td></tr>
<tr><td>Nikolić, G.: Pneumatika, Školske novine, Zagreb, 1994.</td><td></td><td></td></tr>
<tr><td>Koroman, V.; Mirković, R.: Hidraulika i pneumatika, Školska knjiga, Zagreb, 1991.</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">Lang, R.A. (ed.): Hydraulic Trainer 1; Planning and Design of Hydraulic Power Systems, Mannesmann Rexroth AG, 1998.
Rabie, M.: Fluid Power Engineering, McGraw-Hill, 2009.</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>
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NAME OF THE COURSE	INFORMATION SYSTEMS FOR PLM						
Code	FELM03	Year of study	2.				
Course teacher	Stipo Čelar, Ph. D., Associate Professor	Credits (ECTS)	5				
Associate teachers		Type of instruction (number of hours)	L	S	AE	LE	DE
			30	0	30	0	0
Status of the course	Elective	Percentage of application of e-learning	0				

COURSE DESCRIPTION

Course objectives	Training students for: - understanding of Information Systems (IS) types, - understanding of IS development methodologies, - understanding and analyse of product's and material's life cycle in business systems (BS) and in information systems, - understanding of basic functionalities of PLM and PDM solutions, - understanding and application of basic ERP and PLM implementation ways.		
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 an architecture of IS and BS, - analyse the different types of articles/items/products and their life cycles in the BS and IS, - identify the advantages and disadvantages of the application of integrated PLM solutions, - design a small production company with necessary products and processes - implement and parameterise an ERP/PLM solution for the designed small production company, - participate in a larger ERP/PLM implementation project.		
Course content broken down in detail by weekly class schedule (syllabus)	Course content	L hours	AE hours
	Introduction. Historical overview. Product life cycle	2	
	PDM i PLM definitions and characteristics	2	
	Production system principles – Manufacturing Execution System (MES)/Manufacturing Operations Management (MOM)	2	
	Integration between business, production and control systems. ISA-95 Standard	2	
	IS development methodologies. IDEFO. Data flow diagram	2	
	Plan-driven vs. agile development	2	
	SW processes and standards vs. SW life cycle. ISO 12207	2	
	First midterm *pause*		
	Business process and Lean processes	2	
	Business Process Modelling (BPM) and UML modelling processes	2	
	Chart of accounts and accounting	2	
	SCM, ERP and PLM systems	2	
	Cloud technologies and solutions	2	

	Problems and challenges of Application of PLM systems in practice	2	
	Second midterm *pause*		
	List of laboratory exercises		AE hours
	Introduction to the work method. Defining of project teams and seminar topics selecting		2
	Exercises in the test ERP/PLM system		4
	Weekly meeting with a mentor (professor / assistant) during semester		10
	Periodicaly presentation with a mentor (professor / assistant) and other groups (idea, koncept, model)		6
	Final project's presentation (with other groups)		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	Research	0,8	Practical training	1
	Experimental work		Report		Individual work	1
	Essay		Seminar essay		Laboratory exercises	0,2
	Tests		Oral exam	0,5	Preparation for laboratory exercises	
	Written exam		Project	0,5	(Other)	

Grading and evaluating student work in class and at the final exam	There is no midterms and final exams (tests). During the semester the students work on a practical project – they create your own Data Warehouse. The project is done in small project teams, under the professor's mentorship. The teams present their work on a project (business problem, concept, model, design, reports) several times in a semester. The exam is taken individually or in small groups (project teams), carried out as practical oral exam (based on team's project). The exam is public and may be attended by all students who had passed it already. Grade (in percentage) is formed according to the formula: Grade(%) = 0,8 OE + 0,2 LE the activities in percentage: • OE – oral exam, • LE – laboratory assessment (*written project material*).

Required literature (available in the library and via other media)	**Title**	**Number of copies in the library**	**Availability via other media**
	S. Čelar: Authorised lectures, FESB		e-learning portal
	J. Stark: Product Lifecycle Management- 21st Century Paradigm for Product Realisation, 2nd edition, Springer, ISBN 978-0-85729-545-3, London, 2011.		

	S. Čelar: Authorised instructions for seminar, FESB		e-learning portal
	M. Turić; S. Čelar: Authorised instructions for laboratory exercises, FESB		e-learning portal
Optional literature (at the time of submission of study programme proposal)	Saaksvoury, A. Immonen: Product Lifecycle Management, Springer, 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		
Other (as the proposer wishes to add)			

NAME OF THE COURSE	MACHINE TOOLS AND SYSTEMS						
Code	FETM01	Year of study	1				
Course teacher	Dražen Bajić, Ph. D., Full Professor Sonja Jozić, Ph. D., Assistant Professor	Credits (ECTS)	5				
Associate teachers	Mario Veić, Teaching assistant	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 basic machine tool parts, types of machine tools and their possible application. - acquisition of knowledge about the modern machine systems, - acquisition of knowledge of machine tools manual programming and programming in CAD/CAM systems for producing parts with simple and complex geometry.		
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: - present the principles of operation and application of machine tools - characterize features of machine tools - identify motives of high speed and multi-operation machine tools development - analyze the rule of CAD/CAM systems in modern design and production - generate the program for automatic machining on CNC machine tool - compare and highlite deferences between manual programming and programming in CAD/CAM systems.		
Course content broken down in detail by weekly class schedule (syllabus)	Course content	L or S hours	AE hours
	Introduction to machine tools. State of the art and machine tools development. Classification of machine tools.	2	
	Basics of construction machine tools. Testing of machine tools accuracy.	2	
	Main parts of machine tools. Bearing elements, guides, spindle bearings.	2	
	Driving system of machine tools.	2	
	Machine tools control system.	2	
	Turning machines: Classification and basic concepts. Milling machines: Classification and basic concepts	2	
	Machine tools for drilling, broaching, sawing, grinding. Machines for gear wheels manufacturing.	2	
	First midterm exam		
	Automatic tool change. Automatic workpiece change.	2	
	Machine tools for high performance machining operation. Machining center. Turning center. Grinding center.	2	
	High Speed machine tools. Parallel kinematics for machine tools	2	
	Flexible manufacturing structures: flexible machining cells, flexible machining systems, flexible transfer lines.	2	

	Basic concept of CNC manual and automatic programming.	2	
	Examples of NC programming. Softwares for CAD/CAM	2	
	Second midterm exam		
	List of laboratory or design exercises		LE hours
	Movement, typical parts and mechanisms of machine tools installed in the laboratory. Determination of degree of machine tool workspace efficency.		2
	Determination of gerabox efficiency on turning machine. Determination of efficiency		2
	Determination of gearbox efficiency on drilling machine.		2
	Testing of geometric accuracy lathes and drills. Influence of machine tool on the machining accuracy.		2
	Manual programming: CNC turning machine		2
	Manual programming: CNC turning machine		2
	Manual programming: CNC turning machine		2
	Rigidity of the system machine-tool-woorkpiece		2
	Zero point of the workpiece and zero point of the tool at vertical machining center.		2
	Automatic CNC programming in CATIA		2
	Automatic CNC programming in CATIA		2
	Automatic CNC programming in CATIA		2
	Creation of CNC profram for vertical machining center		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	3
	Essay		Seminar essay		(Other)	
	Tests		Oral exam		(Other)	
	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. In the final exams students that did not pass the midterm exams take part. In the makeup exam students take the entire exam. The midterm, final and makeup exams are carried out as written tests. The requirements for passing grade is: 1. Positive assessment of programing task “Manual programming of CNC lathes” 2. 50 % points on each midterm exam or the final exam. Grade (in percentage) is formed according to the formula: Grade(%) = 0,2 L + 0,4 (M1 + M2) L – result of programing task “Manual programming of CNC lathes” M1, M2 – test results of first and second midterm exam. Final grade is determined according to: Percentage Grade 50% do 61% sufficient (2)

<table>
<tr><td></td><td colspan="3">62% do 74% good (3)
75% do 87% very good (4)
88% do 100% excellent (5)

Examination terms: according to the timetable</td></tr>
<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>Xun Xu: „Integrating Advanced Computer-Aided Design, Manufacturing, and Numerical Control: Principles and Implementations“, University of Auckland, New Zealand, 2009</td><td></td><td></td></tr>
<tr><td>Hoffmann M.: „CAD/CAM mit CATIA V5“, Hanser Verlag, Muenchen, 2005.</td><td></td><td></td></tr>
<tr><td>Lopez de Lacalle, Lamikiz "Machine tools for high performance machining", Springer, 2008.</td><td></td><td></td></tr>
<tr><td>Optional literature (at the time of submission of study programme proposal)</td><td colspan="3">- Cebalo, R., "Alatni strojevi – Odabrana poglavlja", Vlastito izdanje, Zagreb, 2001.
- Pahole, I., Balič, J., "Obdelovalni stroji", Univerza v Mariboru, Maribor 2003.</td></tr>
<tr><td>Quality assurance methods that ensure the acquisition of exit competences</td><td colspan="3">- Keeping records of class attendance
- Evaluation of results in accordance with the above learning outcomes
- Feedback from students via surveys
- Self-evaluation of teachers
- Feedback information from graduated students</td></tr>
<tr><td>Other (as the proposer wishes to add)</td><td colspan="3"></td></tr>
</table>

NAME OF THE COURSE	MAINTENANCE MANAGEMENT						
Code	FETM03	Year of study	2				
Course teacher	Jani Barle, Ph. D., Full Professor	Credits (ECTS)	5				
Associate teachers	Stipe Perišić, Teaching assistant	Type of instruction (number of hours)	L	S	AE	LE	CE
			45	0	15	0	0
Status of the course	Obligatory	Percentage of application of e-learning	0				

COURSE DESCRIPTION

Course objectives	Upon completion the student will be able to critically evaluate administrative, financial, and technical actions for assessing and planning maintenance operations.		
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: 1. Combine various maintenance management and related techniques. 2. Monitor technical system endurance and risks associated with usage. 3. Estimate availability and maintenance costs. 4. Organize technical system accelerated testing and acceptance procedures 5. Link principles and practice of condition-based maintenance.		
Course content broken down in detail by weekly class schedule (syllabus)	Course content	L hours	AE hours
	The role and scope of maintenance engineering. Bathtub curve. Historical aspects and applications of maintenance actions and strategies.	3	
	Maintenance-related case studies.		1
	Standards (IEC EN 61508). Maintenance assets register. Technical performance indicators. Failure, failure cause, failure mode and consequence. Failure Mode and Effect Analysis (FMEA) and Root Cause Analysis (RCA).	3	
	FMEA examples.		1
	Constant and time-dependent failure rate models. Component design life.	3	
	Nonparametric life data analysis - 1.		1
	Life data analysis, Nonparametric life estimate procedures and parametric life models. Model selection.	3	
	Nonparametric life data analysis - 2.		1
	Weibull failure models. Confidence intervals.	3	
	Parametric life data analysis - 1.		1
	Reliability block diagrams (RBD), Fault Tree Analysis (FTA) - principles and comparison.	3	
	Parametric life data analysis - 2.		1
	Markov model fundamentals. Availability. Load-sharing.	3	
	Redundancy, models compliant to the IEC EN 61508 (k-out-of-n, active, passive, stand-by, load sharing).		1
	The role and applications of technical diagnostics.	3	
	Technical diagnostics case studies.		1
	Data sources and/or expert judgments. Burn-In. Bayesian analysis in formal safety assessment (FSA).	3	
	Reliability data sources - examples.		1

	Spare parts and materials planning, purchasing and storage.	3	
	Examples of repairable items modeling.		1
	Physical reliability models. Accelerated testing and burn-in procedures.	3	
	Covariate damage models.		1
	Optimal preventive maintenance scenarios and models.	3	
	Numerical analysis of optimal preventive maintenance modes (planned and opportunistic).		1
	Maintenance information system, documents and organization structure. Maintenance Performance Indicators.	3	
	Comparative indices case studies.		1

Format of instruction	☒ lectures ☒ seminars and workshops ☒ exercises ☐ *on line* in entirety ☐ partial e-learning ☐ field work	☐ individual assignments ☒ multimedia ☒ laboratory ☐ work with mentor ☐ individual project (other)
Student responsibilities	Class attendance, tests, project presentation and oral exam.	

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	0,5	Individual work	2,0
	Essay		Seminar essay		Preparation for exercises	0,3
	Tests	0,2	Oral exam		(Other)	
	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-week session classes and the second one is after the next 6 weeks. The first midterm is carried out as written test on basic issues covered within the first session. The second midterm is seminal paper on selected and more advanced topic. Selected topic must be discussed with respect to the course framework. The requirement for passing grade is the positive assessment on each midterm exam (>49%) or the final exam.
The final score is:

$$Score\ (\%) = 0,35 \cdot A_1 + 0,35 \cdot A_2 + 0,20 \cdot A_3 + 0,10 \cdot A_4$$

- *midterm 1: A_1 = 50 – 100 %,*
- *midterm 2 (seminal paper): A_2 = 50 – 100 %,*
- *oral exam: A_3 = 50 – 100 %.*
- *class attendance: A_4 = 70 – 100 %.*

Score	Grade
50% - 62%	sufficient (2)
63% - 76%	good (3)
77% - 88%	very good (4)
89% - 100%	excellent (5)

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

Title	Number of copies in the library	Availability via other media
Barle, J.: Reliability in maintenance management, (student handbook in Croatian: *Pouzdanost u funkciji održavanja tehničkih sustava*), FESB, Split, 2009.		e-learning portal
Majdandžić, N., "Strategije održavanja i	7	

	informacijski sustavi održavanja", SFSB, Slavonski Brod, 1999.		
Optional literature (at the time of submission of study programme proposal)	Kobbacy, K.A.H.; Murthy D.N.P. (eds), "Complex System Maintenance Handbook", Springer, 2008. Rausand, M.; Høyland, A., "System Reliability Theory: Models, Statistical Methods, and Applications", 2nd ed., Wiley-Interscience, 2003. Rausand, M., "Reliability of Safety-Critical Systems: Theory and Applications", Wiley, 2014.		
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	MANAGEMENT OF PLM PROJECTS						
Code	FETM07	Year of study	2.				
Course teacher	Ivica Veža, Ph. D., Full Professor	Credits (ECTS)	5				
Associate teachers	Marko Mladineo, Ph. D., Teaching assistant	Type of instruction (number of hours)	L	S	AE	LE	DE
			30	0	30	0	0
Status of the course	Elective	Percentage of application of e-learning	0				

COURSE DESCRIPTION

Course objectives	Training students for: - planning and managing projects - calculating profitability of the project and return of investment (ROI)		
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 PLM (Product Lifecycle Management) - analyze customer requirements (VOC) - formulate the main goals of the project and rank them - develop the main project activities and the structure of distribution of work – (Work Breakdown Structure) - plan the time (to determine the critical path) - plan capacity (determine bottlenecks and balance activities) - plan costs and risks - apply adopted knowledge and skills from contents of completed course to solve a specific task - combine and apply adopted knowledge and skills in teamwork		
Course content broken down in detail by weekly class schedule (syllabus)	Course content	L or S hours	AE hours
	Introduction and basic concepts of PLM (product lifecycle management)	2	
	The concept and definition of project and project management	2	
	Projects - vision, strategy, goals (examples - automotive and shipbuilding industries)	2	
	The strategy and project management. Multi-project management.	2	
	Basics of organization. The project organizational structure.	2	
	The phases of the project (initiation of project, project selection, project planning, project management and end of project)	2	
	Methods for project planning.	2	
	Quality management (planning of improvement and quality control)	2	
	Cost management. Continuous Improvement - Kaizen.	2	
	Risk management.	2	
	Psychological and social component of project management. Project manager.	2	
	Teamwork.	2	
	Communication and motivation in the team. Methods for	2	

	stimulating creativity.	
	List of laboratory or design exercises	LE or DE hours
	Introduction to the technique of network planning.	2
	Basic concepts of network planning technique	2
	Analysis of time	2
	CPM method	2
	PERT method	2
	PRECEDENCE method	2
	Cost analysis	2
	Resource analysis	2
	Introduction to the software - Microsoft Project	2
	Introduction to business process management	2
	Basics of process diagrams	2
	Mapping processes	2
	Comparison of different process diagrams	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	0,5
	Tests	0	Oral exam		Preparation for laboratory exercises	
	Written exam		Project	2,0	(Other)	

Grading and evaluating student work in class and at the final exam	During the semester the stages of project management are introduced to students, parallel they attend lectures and laboratory exercises to develop their project. There is project work team and the minimum number of students is two, maximum number is three. During the course they determine the content of their project and main targets. Students develop the main activities of project and the structure of distribution of work (WBS). They plan the time for each activity and determine the critical path. Students also plan capacities and determine bottlenecks and balance capacities. At the end they determine the costs, calculate project profitability (ROI) and analyze risks. On test students present their work which is evaluated (grade M). On the other side students have one test in the field of Network planning techniques (LV) at the end of the semester. • LV - grade of laboratory exercises, • M - points achieved from the project. The final grade (in percentage) is formed according to the formula: Grade (%) = 0,30 LV + 0,70 M

Required literature (available in the library and via other	**Title**	**Number of copies in the library**	**Availability via other media**

media)	Veža, I., Bilić, B., Gjeldum, N., Mladineo, M., "Upravljanje projektima", Fakultet elektrotehnike, strojarstva i brodogradnje, Split, 2011.		e-learning portal
	Majstorović, V. Projektni menadžment, Sveučilište u Mostaru, Mostar, 2010.	5	
	Omazić, M.A. Projektni menadžment, Sinergija, Zagreb, 2005.	5	
Optional literature (at the time of submission of study programme proposal)	"A Guide to the Project Management Body of Knowledge, PMBOK Guide", Project Management Institute, Newtown Square, 2004. Wysocki, R. K., McGary, R., "Effective Project Management: Traditional, Adaptive, Extreme", John Wiley & Sons, 2003.		
Quality assurance methods that ensure the acquisition of exit competences	• Evidence about class attendance • The annual analysis of performance of the examinations • Student survey in order to evaluate teachers • Self-evaluation of teachers • Feedback from students who have already graduated about the relevance of the course content		
Other (as the proposer wishes to add)			

NAME OF THE COURSE	MARKETING						
Code	FEEM08	Year of study	1				
Course teacher	Biljana Crnjak-Karanović, Ph. D.,	Credits (ECTS)	5				
Associate teachers	Goran Dedić, PhD Assistant prof. Zoran Mihanović, PhD Assistant prof.	Type of instruction (number of hours)	L	S	AE	LE	DE
			30	0	30	0	0
Status of the course	Mandatory	Percentage of application of e-learning	10%				

COURSE DESCRIPTION

Course objectives	Training students for: - Critically evaluate the role of marketing in the society and organisations. Analyse market situations and suggest activities aimed at solving practical problems related to marketing.
Course enrolment requirements and entry competences required for the course	Prerequisites are defined by the Faculty Statute and other regulations.
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	Students will be able to: - Analyse market variables and forces and evaluate their influence on company's marketing programme - Understand differences between market-coverage strategies, identify variables used in segmentation and suggest positioning strategies - Analyse product characteristics and identify drivers of product policy changes - Differentiate between levels and types of marketing channels, identify their limitations and suggest criteria for assessment of alternative channels - Identify factors influencing pricing decisions, establish price range for a product and suggest pricing method for a product. - Compare benefits of various types of promotion and explain factors which have to be taken into consideration when deciding on promotional mix.

Course content broken down in detail by weekly class schedule (syllabus)	Course content	L or S hours	AE hours
	Marketing: Creating and capturing Customer Value	2	2
	The evolution of marketing and marketing management: From the production to marketing concept	2	2
	Micro and macromarketing	2	2
	Marketing environment – External environment	2	2
	Marketing environment – Internal environment	2	2
	Marketing research and market opportunity analysis	2	2
	Marketing information system	2	2
	Consumer behaviour	2	2
	Market segmentation – choice of target market and product positioning	2	2
	Market segmentation – choice of target market and product positioning	2	2
	Marketing mix – Products	2	2
	Marketing mix – Pricing	2	2
	Marketing mix – The promotion mix and Integrated marketing	2	2

	communications		
	Marketing mix – Marketing channels	2	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	0,5	Research		Practical training	
	Experimental work		Report		(Other)	
	Essay		Seminar essay		(Other)	
	Tests	5,5*	Oral exam	2,5*	(Other)	
	Written exam	3*	Project		(Other)	

Grading and evaluating student work in class and at the final exam	- Class attendance and activity - Mid and end-term exams or Final exam (written and oral) * *Students who pass both mid and end term exams do not have to take final exam unless they want to improve grade acquired through mid and end-term exams.*

Required literature (available in the library and via other media)	**Title**	**Number of copies in the library**	**Availability via other media**
	Previšić, J. i Ozretić Došen, Đ. (urednici) (2004), MARKETING, Zagreb, Adverta	26	
	Kotler, P. (2001) UPRAVLJANJE MARKETINGOM, Analiza, Planiranje, Primjena i Kontrola (9. izdanje), Zagreb, MATE	9	

Optional literature (at the time of submission of study programme proposal)	- Kotler, P., Armstrong, G., (2012) PRINCIPLES OF MARKETING, NJ, Prentice Hall
Quality assurance methods that ensure the acquisition of exit competences	- Student attendance and participation records - Feedback from students gathered through surveys - Intra-institutional and external evaluations - Exams are aimed at evaluating the learning outcomes. Periodically, exam structure and content is reviewed in order to establish the appropriateness of the exam procedure for proposed learning outcomes.
Other (as the proposer wishes to add)	

NAME OF THE COURSE	OPTIMIZATION METHODS 1						
Code	FESM03	Year of study	1.				
Course teacher	Zoran Babić, Ph. D., Full Professor	Credits (ECTS)	5				
Associate teachers	Branka Marasović, Ph. D.,Assistant Professor	Type of instruction (number of hours)	L	S	AE	LE	DE
			45	0	15	0	0
Status of the course	Obligatory	Percentage of application of e-learning	15%				

COURSE DESCRIPTION

Course objectives	Training students for: understanding and application of basic principles of optimization methods with special accent on the problems that can be presented as linear programming problems.		
Course enrolment requirements and entry competences required for the course	Knowledge of matrix calculus.		
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	Students will be able to accept knowledge about basic quantitative methods which can be applied in bussines decision making with accent on linear programming problems.		
Course content broken down in detail by weekly class schedule (syllabus)	Course content	L or S hours	AE hours
	Basic concepts of vector spaces	3	1
	Scalar product, norm, distance. Linear dependence and independence.	3	1
	The base of vector space, basic solutions. Convex sets	3	1
	Basic concepts of linear programming and graphical method	3	1
	Basic theorems of linear programming	3	1
	The use of linear programming model in business management	3	1
	Simplex method for solving linear programming problems	3	1
	First midterm exam		
	Simplex method for maximum problem	3	1
	Nutrition problem as a minimum problem of linear programming and Charnes M-procedure	3	1
	Linear programming problems in practice	3	1
	Transportation and distribution problems. Classical transportation problem.	3	1
	Assiggnment problems - Hungarian method.	3	1
	The traveling salesman problem Branch and bound algorithm.	3	1
	Second midterm exam		
	List of laboratory or design exercises		LE or DE hours
	WINQSB softver for linear programming		
	Solving linear programming problems with Excel solver		

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		Oral exam	2.5	(Other)	
	Written exam	**2**	Project		(Other)	

Grading and evaluating student work in class and at the final exam	During the year, three preliminary tests will be organized Positively solved tests (50% of total points) replace the written exam for the current school year. Alternatively, students can pass the written exam during the exam period. Oral exam can be taken after students pass a written exam.

	Title	**Number of copies in the library**	**Availability via other media**
Required literature (available in the library and via other media)	Z. Babić: Linear programming (in Croatian), Faculty of Economics Split, 2010.	10	

Optional literature (at the time of submission of study programme proposal)	1. L. Neralić: Uvod u matematičko programiranje 1, Element, Zagreb, 2004. 2. C. P. Bonini, W.H. Hausman, H. Bierman: Quantitative analysis for management, McGraw-Hill, 1997. 3. Lj. Martić: Matematičke metode za ekonomske analize II, Narodne novine, Zagreb, 1979.
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)	

<table>
<tr><td>NAME OF THE COURSE</td><td colspan="6">OPTIMIZATION METHODS 2</td></tr>
<tr><td>Code</td><td>FESM05</td><td>Year of study</td><td colspan="5">1</td></tr>
<tr><td>Course teacher</td><td>Damir Vučina, 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">Igor Pehnec, Ph. D., Teaching assistant
Ivo Marinić- Kragić, 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>45</td><td>0</td><td>0</td><td>15</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">Acquiring theoretical know-how in basic numerical methods and algorithms in engineering optimization.
Developing competences in applying computers in engineering numerical optimization.
Acquire competences in applying numerical tools in engineering problems.</td></tr>
<tr><td>Course enrolment requirements and entry competences required for the course</td><td colspan="6">Completed pre-graduate studies which include courses equivalent to computer-aided analysis. Competences in basic engineering analysis methods and program development in MATLAB</td></tr>
<tr><td>Learning outcomes expected at the level of the course (4 to 10 learning outcomes)</td><td colspan="6">After completing the course the students will be able to:
- formulate the engineering problem as an engineering problem of decision making
- model the set of decision variables, constraints and excellence functions for engineering problems
- make flowcharts for different optimization methods
- apply gradient optimization methods (HJ, NM) to engineering problems
- apply non-gradient optimization methods (SD, CG, N, BFGS) to engineering problems
- solve nonlinear optimization problems with constraints
- apply evolutionary optimization methods and metaheuristics (GA; ACO, SA, NN) to engineering problems
- apply optimization methods to network problems: min. path, min. spanning tree, max. flow, ..
- develop and test own optimization models and methods in MATLAB</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 hours</td><td>AE hours</td></tr>
<tr><td colspan="4">Introduction, basic theoretical concepts. Basic terms and examples of application.</td><td>3</td><td></td></tr>
<tr><td colspan="4">Basic concepts, theoretical aspects, optimization models</td><td>3</td><td></td></tr>
<tr><td colspan="4">Linear programming, standard model</td><td>3</td><td></td></tr>
<tr><td colspan="4">Linear programming, simplex method</td><td>3</td><td></td></tr>
<tr><td colspan="4">Nonlinear programming, 1D methods: Interval halving, Fibonacci, Golden section, Interpolation methods, reduction of nD problems to 1D</td><td>3</td><td></td></tr>
<tr><td colspan="4">Nonlinear programming, n-dimensional methods for unconstrained problems: direct methods (Random search, Hookee-Jeeves, Powell, Nelder-Mead, other)</td><td>3</td><td></td></tr>
</table>

	Nonlinear programming, n-dimensional methods for unconstrained problems: gradient methods (Steepest descent, Conjugate directions method, Newton and Quasi-Newton methods)	3	
	First midterm exam		
	- Nonlinear programming, constrained n-dimensional method: transformation methods (external and intternal penalty methods, other)	3	
	- Nonlinear programming, constrained n-dimensional method: basic concepts in direct methods: (feasible directions, generalized reduced gradients, SLP, SQP,..)	3	
	Basic concepts in evolutionary methods and special chapters: simulated annealing, genetic algorithms, etc.	3	
	Basic concepts in evolutionary methods and special chapters: neural networks as approximators	3	
	Basic concepts and procedures: optimization with discrete variables, branch and bound, GAs. Network problems shortest path, min. spanning tree, max. flow	3	
	Examples of setting-up physical and mathematical models for optimization for different engineering problems. Development of algorithms. Development of progams in C and MATLAB.	3	
	Second midterm exam		
	List of laboratory exercises		LE hours
	Basic terms and examples of application.		1
	Optimization models		1
	Linear programming, standard model, examples		1
	Linear programming, Simplex method, examples		1
	Nonlinear programming, 1D methods, examples		1
	Nonlinear programming, unconstrained n-dimensional methods, examples		1
	Nonlinear programming, unconstrained n-dimensional methods, examples		1
	Nonlinear programming, (NLP) constrained n-dimensional methods, examples		1
	Nonlinear programming, (NLP) constrained n-dimensional methods, examples		1
	Examples of application of neural networks		1
	Examples in evolutionary methods, genetic algorithms		1
	Examples in evolutionary methods, genetic algorithms		1
	Examples of application in engineering and modeling		1
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.		

<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>3</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></td></tr>
<tr><td>Tests</td><td></td><td>Oral exam</td><td></td><td>Preparation for laboratory exercises</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">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 respective theoretical questions and numerical problems. The final tests consist of overall 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(%) = 0,5 (M1 + M2)
the activities in percentage:
• M1, M2 – test results.</td></tr>
<tr><td rowspan="5">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">- D. Vučina, 'Metode inženjerske numeričke optimizacije', Sveučilište u Splitu, FESB 2005</td><td></td><td></td></tr>
<tr><td colspan="3">- J. S. Arora, “Introduction to Optimum Design”, McGraw Hill, 1989</td><td></td><td></td></tr>
<tr><td colspan="3">I.Pehnec, Materijali za laboratorijske vježbe</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">- G. Vanderplaats, "Numerical Optimization Techniques for Engineering Design", - Vanderplaats Research and Development, 1999
- A. D. Belegundu, T. R. Chandrupatla, “Optimization Concepts and Applications in Engineering”, Prentice Hall, 1999
- S.S. Rao, “Engineering Optimization”, Wiley Interscience, 1996
- D.E. Goldberg, "Genetic algorithms in search, optimization and machine learning", Addison Wesley, 1989
- S. Haykin, "Neural Networks", Prentice Hall International, 1999</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
- Institutional and non-institutional evaluations</td></tr>
<tr><td>Other (as the proposer wishes to add)</td><td colspan="6"></td></tr>
</table>

NAME OF THE COURSE	PLANT LAYOUT						
Code	FETL05	Year of study	2.				
Course teacher	Ivica Veža, Ph. D., Full Professor	Credits (ECTS)	5				
Associate teachers	Marko Mladineo, Ph. D., Teaching assistant	Type of instruction (number of hours)	P	S	AV	LV	KV
			30	0	0	15	15
Status of the course	Obligatory	Percentage of application of e-learning	0				

COURSE DESCRIPTION

Course objectives	Educate students to be able to: • realize feasibility study in projecting a new production system, • project of phases of production system (define macro and micro locations, surfaces, basic elements of building, basic production structures, work conditions), • understand basics of material flow calculation, human factor, information and energy.		
Course enrolment requirements and entry competences required for the course	Course enrolment requirements: None Required competences: Competences and skills achieved after finishing bachelor studies of industrial engineering, mechanical engineering and naval architecture		
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	Students will be able to: 1. Analyse content of previous study realized, 2. Compare criteria in micro and macro location selection phase, 3. Define number of workplaces, 4. Create transport intensity chart, 5. Compare layout according to processing type (Workshop principle) and purpose groups, 6. Define production surface with discontinuity coefficients method, 7. Analyse functional surfaces (sketch machine with functional surface, unit field and height of factory hale), 8. Apply achieved knowledge and skills on real example		
Course content broken down in detail by weekly class schedule (syllabus)	Course content	P hours	AV hours
	Introduction. Term “system”, system types. Production system.	2	
	Scope, nature and objectives of design of production process.	2	
	Basic principles in production process modelling.	2	
	Interrelations of basic factors in production.	2	
	Previous study.	2	
	Location problems. Main factors for micro and macro location selection.	2	
	Production system segmentation.	2	
	Production surface calculation, defining of functional surfaces on workplace. Distances between machines and elements.	2	
	Calculation of block scheme of surface layout. Election of basic building parameters.	2	
	Material flow types. Spatial structure designing.	2	
	Layout methods for cases with group by types.	2	
	Production and assembly lines balancing	2	
	Workplace and work conditions designing. The appearance of fatigue. Work conditions.	2	

	List of laboratory exercises	LV hours
	Introduction to spatial structures	2
	Layout according to purpose. Production line balancing	2
	Layout according to purpose. Modified triangle method	2
	Layout with fixed position. Hungary method	2
	Layout problem with predefined locations	2
	Transportation problems	2
	Program task setting	1
	List of construction exercises	KV hours
	Capacity load calculation	2
	Transport units defining	2
	Defining of optimal spatial layout	2
	Storage calculation	2
	Required surface calculation	2
	Preparation of technical drawing of projected production system	2
	Handover of program task	1

Format of instruction	☒ Lectures ☒ Seminary work and workshops ☒ Exercise ☐ *on line* in full ☐ mixed e-learning ☐ fieldwork lectures	☒ Solo tasks ☐ Multimedia ☒ Laboratory work ☒ Mentorship ☐ (other)
Student responsibilities	Presence on lectures and auditory exercise minimally 70% in total. All laboratory exercise and project task realized.	

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	0,5
	Tests	0	Oral exam		Preparation for laboratory exercises	
	Written exam		Project	2,0	(Other)	

Grading and evaluating student work in class and at the final exam	During the semester it will be realized two colloquiums. First is after 7 weeks of lectures, and second after 6 weeks. Students have possibility to retake again part of the curriculum on final exam, if they didn't pass in regular dates. Each of colloquiums has to be written as a written exam in duration of 45 minutes. Each colloquium has 5 theoretical questions. Passing condition is 40% of total points on each of colloquiums and project task done. To students are introduced phases of production system modelling. Therefore, besides lectures, they are attending to laboratory exercises and according to them, they realizing production system modelling. Students presenting their project tasks on colloquium and those tasks are also included in grade forming (grade KV). • KV – grade from lectures, • LV – grade from laboratory work, • M1, M2 – colloquium points. Final grade (in percent) formed according to formula: Grade (%) = 0,20 KV + 0,20 LV + 0,3 (M1 + M2)

Required literature (available in the library and via other media)	**Title**	**Number of copies in the library**	**Availability via other media**
	Veža, I., Bilić, B., Bajić, D., "Projektiranje proizvodnih sustava", Fakultet elektrotehnike,		e-learning portal

	strojarstva i brodogradnje, Split, 2001.		
Optional literature	Aggteleky, B., “Fabrikplanung: Werksentwicklung und Betriebsrationalisierung.-Band 1,2,3”., Carl Hanser Verlag, München, 1990. Schenk, M., Wurth, S., “Fabrikplanung und Fabrikbetrieb Methoden für die wandlungsfähige und vernetzte Fabrik”, Springer Verlag, Berlin, Heidelberg New York, 2004.		
Quality assurance methods that ensure the acquisition of exit competences	- Evaluation of results in accordance with the above learning outcomes - Annual analysis of the performance of the examinations - 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	PRINCIPLES OF MANUFACTURING PROCESS DESIGN						
Code	FETM02	Year of study	2.				
Course teacher	Boženko Bilić, Ph.D., Full Professor	Credits (ECTS)	5				
Associate teachers	Nikola Gjeldum, Ph. D., Assistant professor Ivan Peko, Teaching assistant.	Type of instruction (number of hours)	L	S	AE	LE	DE
			30	0	0	15	15
Status of the course	Obligatory	Percentage of application of e-learning	0				

COURSE DESCRIPTION			
Course objectives	Training students for manufacturing process design in part production in order to meet the requirements of a modern market i.e. product quality, product cost and time to delivery.		
Course enrolment requirements and entry competences required for the course	Completed undergraduate study industrial engineering, shipbuilding or mechanical engineering.		
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	Students will be able to: - Explain the characteristics of discrete and continuous material flows in the production process - Evaluate manufacturing processes with regard to their characteristics and required characteristics of the product - Analyze technological properties of the product - Select the optimal raw materials (shape, dimensions and quantity) with respect to the constructional, technological and economic requirements - Select machine tools, tools, clamping devices and process parameters. - Prepare manufacturing documentation. - Determine the optimal batch size - Determine manufacturing cost		
Course content broken down in detail by weekly class schedule (syllabus)	Course content	L hours	AE hours
	Introduction. Definition of production system, production and manufacturing process. Fundamentals of material flow design in the production process. The basic elements of manufacturing processes (process, composed and group process steps, process step).	2	
	Characteristics of modern technologies and manufacturing processes. Manufacturing process capability. Manufacturing processes: Metal casting processes. Powder metallurgy. Metal forming processes. Material removal processes. Joining processes. Heat treatment and surface protection. Processing of polymer materials.	4	
	The basic principles of manufacturing process design. Analysis of technical drawings (of product). Dimension chain. The selection of raw material.	3	
	The choice of manufacturing process and machine tools. Sequence of manufacturing processes and process steps. Selection of manufacturing baselines. Selection of tools, tool holders and cutting parameters.	3	0
	The classification and calculation of the processing time (setup time, processing time, auxiliary time and additional time). Cycles of production.	2	

	First midterm exam		
	Clamping devices. The basic principles of designing special clamping devices.	3	
	Manufacturing documentation. Calculation of manufacturing costs.	1	
	Errors in manufacturing processes.	3	0
	Group technology: Basic principles of group technology. Basic methods for grouping parts. Machine layouts. Group technology application advantages.	2	0
	Determining the optimal batch size.	3	0
	Second midterm exam		
	List of laboratory exercises		LE hours
	3D model design using Siemens NX software		8
	Drafting of workshop documentation using Siemens NX software		3
	3D printing exercises		2
	List of design exercises		DE hours
	Design example of manufacturing process: D**etailed elaboration** of manufacturing process - tools selection, cutting parameters selection, calculation of batch production time.		6
	Autonomous students work on individual project tasks		7

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 and exercises in the amount of at least 70 % of the times scheduled. Perform all laboratory exercises. Individual project tasks completed.	

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
	Essay		Seminar essay		Laboratory exercises	0,5
	Tests	0	Oral exam		Preparation for laboratory exercises	0
	Written exam	0	Project	1	(Other)	

Grading and evaluating student work in class and at the final exam	During semester there are two midterm exams. The first midterm exam is after 7 weeks of lecturing and the second one is after the next 6 weeks. The student can take the first midterm exam if he/she regularly attended classes. Requirements for access to the second midterm exam are: regularly attended classes, at least 25% of points achieved at the first midterm and positively evaluated individual project. Midterm exams are conducted in written form. They consist of theoretical questions and numerical problems. The teacher reserves the right to hold a midterm exam in oral form. Requirements for access to the final exams are: regularly attended classes and positively evaluated individual project. In the first two final exams students that did not pass at least one of the midterm exams take part. In the third and fourth final exams students take the whole exam regardless results of midterm exams. Final exams are conducted in written form. They consist of theoretical questions and numerical problems. The teacher reserves the right to hold a final exams in oral form. The requirements for passing grade are positive assessment of individual project and positive assessment in exam. Positive assessment represents minimal 50% points on each midterm exam or minimal 50% points on final exam. Grade (%) = 0,4D + 0,6E D – Individual project grade (%)

<table>
<tr><td></td><td colspan="3">E – average points achieved on midterm exams expressed as a percentage or number of points achieved on the final exam expressed as a percentage.

Grade (%): Final mark:
50% - 60% sufficient (2)
61% - 75% good (3)
76% - 90% very good (4)
91% - 100% excellent (5)</td></tr>
<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>G. Halevi: Process and Operation Planning, Kluwer Academic Publishers, 2003.</td><td>0</td><td></td></tr>
<tr><td>P. Scallan: Process Planning: The design/manufacture interface, Butterworth-Heinemann, 2003.</td><td>0</td><td></td></tr>
<tr><td>G. Halevi, R. D. Weill: Principles of Process Planning: A logical approach, Chapman & Hall, 1995.</td><td>0</td><td></td></tr>
<tr><td>M. Jurković, Dž. Tufekčić: Tehnološki procesi: projektiranje i modeliranje, Mašinski fakultet, Tuzla, 2000.</td><td>0</td><td></td></tr>
<tr><td>Optional literature (at the time of submission of study programme proposal)</td><td colspan="3">- B. Bilić: Predavanja postavljena na e-learning portalu
- N. Gjeldum: Predavanja postavljena na e-learning portalu
- V. Gačnik, F. Vodenik: Projektiranje tehnoloških procesa, Tehnička knjiga, Zagreb, 1990.
- B. Buchmeister, A. Polajnar: Priprava proizvodnje za delo v praksi, Fakulteta za strojništvo, Maribor, 2000.</td></tr>
<tr><td>Quality assurance methods that ensure the acquisition of exit competences</td><td colspan="3">- Keeping records of the attendance of students
- Annual evaluation of results in accordance with the above learning outcomes
- Feedback from students via surveys
- Self-evaluation of teachers
- Feedback from students who have already graduated related to 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	PRODUCT DEVELOPMENT AND MANAGEMENT						
Code	FESM16	Year of study	2				
Course teacher	Lovre Krstulović-Opara, Ph. D., Full Professor	Credits (ECTS)	5				
Associate teachers		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	40%				

COURSE DESCRIPTION

Course objectives	Training students for: - Effective product management during product life cycle under changing market conditions and requests. - Acquiring knowledge about product structure and product architecture. - Understanding phases of product life cycle. - Systems and packages supporting Product life cycle management (PLM). - Concept generation for emerging concepts and concept visions. - Understanding and using Product data management (PDM) package as part of SolidWorks.		
Course enrolment requirements and entry competences required for the course	Design of industrial products.		
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	Students will be able to: - Explain PDM system and it's interactions with other applications. - Describe process of implementation and set up of PLM system. - Count advantages of PLM system in enterprises. - Describe product lifecycle. - Describe product concept design. - Describe team for concept design. - Paraphrase concept design in car industry. - Describe concepts in insecure market. - Describe concepts of visions. - Design as a team work simple industrial product based on PDM SolidWorks system.		
Course content broken down in detail by weekly class schedule (syllabus)	Course content	L or S hours	AE hours
	Systems for Product lifecycle management (PLM).	2	
	Product structure. Integration of PLM with other applications.	2	
	Implementation and setting of PLM system	2	
	Advantages of using PLM systems.	2	
	Product lifecycle.	2	
	Product concept design.	2	
	Team for concept design.	2	
	Process of generating concepts. User information in process of product development.	2	
	Concept design in car industry.	2	
	Concept design in insecure markets.	4	
	Concepts of visions.	4	
	List of laboratory or design exercises		DE hours
	CAD modelling in SolidWorks		4
	CAD modelling in SolidWorks PDM for Workgroups.		4

	Organising of product development groups.	2
	Product dissemination.	4
	Defining CAD data basis (vault)	4
	Defining CAD supplement applications.	4
	Presentation of student projects.	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 ☒ work in project groups
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	3	Research		Practical training	
	Experimental work		Report		Individual work	1
	Essay		Seminar essay	1	(Other)	
	Tests		Oral exam		(Other)	
	Written exam		Project		(Other)	

Grading and evaluating student work in class and at the final exam	Evaluation of gained knowledge in form of two colloquiums. Maximal score is 100 points, while minimum is passing of exam is with 50 points. Exam: individual, theoretical. Mode of exam: written form.

Required literature (available in the library and via other media)	**Title**	**Number of copies in the library**	**Availability via other media**
	Product Development and Management (script in process of review)		E-learning
	Additional course materials		E-learning

Optional literature (at the time of submission of study programme proposal)	- L. Krstulović-Opara, Ž. Domazet, Dizajni industrijskih proizvoda – mrežna skripta - Ulrich, K.; Eppinger, S., "Product Design and Development", Irwin, McGraw-Hill, 2008.
Quality assurance methods that ensure the acquisition of exit competences	- Student evaluations - Registering student's attendance to course
Other (as the proposer wishes to add)	

NAME OF THE COURSE	PRODUCT LIFECYCLE MANAGEMENT						
Code	FETM06	Year of study	2.				
Course teacher	Jani Barle, Ph.D., Full Professor Boženko Bilić, Ph. Full Professor	Credits (ECTS)	5				
Associate teachers	Marko Mladineo, Ph.D., Teaching assistant	Type of instruction (number of hours)	L	S	AE	LE	DE
			30	0	30	0	0
Status of the course	Obligatory	Percentage of application of e-learning	0				

COURSE DESCRIPTION

Course objectives	Student acquire knowledge about the basic components of the platform to manage lifecycle of products related to the process of designing products, determination of the technological processes of production, the production process itself and sustainability over time of exploitation, as well as the recycling of products.		
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: - Classify product features - Explain phases of the product life cycle - Combine various maintenance management and related techniques - Monitor technical system endurance and risks associated with usage. - Organize technical system accelerated testing and acceptance procedures		
Course content broken down in detail by weekly class schedule (syllabus)	Course content	L hours	AE hours
	Introduction in PLCM. Types of products. The initiators of product development. Marketing mix. Production program. The characteristics of different production structures.	4	0
	Product development.	3	0
	Introduction of products on the market.	2	0
	Phase growth of products on the market. Phase maturity of products on the market.	2	0
	Phase decline of products on the market.	2	0
	Recycling products and materials.	1	0
	First midterm exam.		
	The role and application of the maintenance actions (corrective, preventive, predictive, proactive). RCM and TPM strategies. Applicable standards like IEC EN 61508. Bathtub curve and respective actions.	2	4
	Maintenance assets register, systems and interfaces. Technical performance indicators. Failure, failure cause, failure mode and consequence. Human errors in maintenance.	2	4
	Parametric reliability models of component. Interval and right censored data related to warranty and maintenance	2	4
	Parametric reliability models of component. Constant and time-dependent failure models (Exponential, Weibull, Log-normal). Probability plots.	3	6
	Reliability of systems. Serial configuration and redundancy models. Maintainability concept and availability models. Overview of influential factors.	3	6

	Physical reliability models. Accelerated testing and burn-in procedures. Optimal preventive maintenance scenarios and models.	2	4
	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.	

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	2,5
	Essay		Seminar essay		Laboratory exercises	
	Tests	0,2	Oral exam		Preparation for exercises	0,3
	Written exam		Project		(Other)	

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

During semester there are two midterm exams. The first midterm exam is after 7 weeks of lecturing and the second one is after the next 6 weeks. The student can take the midterm exams if he/she regularly attended classes. Midterm exams are conducted in written form. They consist of theoretical questions and numerical problems. The teacher reserves the right to hold a midterm exam in oral form.
The final score is:

$$Score\ (\%) = 0,35 \cdot A_1 + 0,35 \cdot A_2 + 0,20 \cdot A_3 + 0,10 \cdot A_4$$

- *midterm 1:* A_1 *= 50 – 100 %,*
- *midterm 2:* A_2 *= 50 – 100 %,*
- *oral exam:* A_3 *= 50 – 100 %.*
- *class attendance:* A_4 *= 70 – 100 %.*

Score	Grade
50% - 62%	sufficient (2)
63% - 76%	good (3)
77% - 88%	very good (4)
89% - 100%	excellent (5)

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

Title	Number of copies in the library	Availability via other media
B. Bilić: Predavanja postavljena na e-learning portalu		e-learning portal
J. Barle: Reliability in maintenance management, (student handbook in Croatian: Pouzdanost u funkciji održavanja tehničkih sustava), FESB, Split, 2009.		e-learning portal

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

- J. Stark: Product Lifecycle Management: 21st Century Paradigm for Product Realisation, 2nd Ed., Springer; 2011.
- M. Rausand: Reliability of Safety-Critical Systems: Theory and Applications, Wiley, 2014.
- A. Saaksvuori, A. Immonen: Product Lifecycle Management, Springer, 2005.

Quality assurance methods that ensure the acquisition of exit competences

- Keeping records of the attendance of students
- Annual evaluation of results in accordance with the above learning outcomes
- Feedback from students via surveys

	- Self-evaluation of teachers - Feedback from students who have already graduated related to the relevance of the course content
Other (as the proposer wishes to add)	

NAME OF THE COURSE	PRODUCTION MANAGEMENT						
Code	FETL09	Year of study	2.				
Course teacher	Ivica Veža, Ph. D., Full Professor	Credits (ECTS)	5				
Associate teachers	Marko Mladineo, Ph. D., Teaching assistant	Type of instruction (number of hours)	L	S	AE	LE	DE
			45	0	30	0	0
Status of the course	Obligatory	Percentage of application of e-learning	0				

COURSE DESCRIPTION

Course objectives	Training students to: • production planning and management • making/drafting technological oriented investment projects • be able to simulate the materials flow		
Course enrolment requirements and entry competences required for the course	Competences and skills learning outcomes of undergraduate study in industrial engineering, naval architecture or mechanical engineering.		
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	Students will be able to: 1. Analyze the business model of supply chain management. 2. Analyze the concept of production planning and control. 3. Evaluate management models of production data. 4. Model and simulate the operation of a flexible/intelligent manufacturing system. 5. Recommend software solutions for integrated planning and production management. 6. Apply simulation programs on production problems. 7. Apply acquired knowledge and skills from previous courses on solving the specific task. 8. Prepare technology oriented investment project.		
Course content broken down in detail by weekly class schedule (syllabus)	Course content	L or S hours	AE hours
	Production function. Production management. Production management strategies.	3	
	Product designs. New product developing process.	3	
	Supply chain (Supply chain management).	3	
	Production planning and control.	3	
	Materials planning and inventory control.	3	
	Concepts for production planning and control: network techniques planning, methods of optimal capacity utilization.	3	
	Procedure Just in time – JIT.	3	
	Method for manufacturing resource planning (MRP, MRP II, ERP),	3	
	Optimized production technology, OPT, management progressive numbers. Improvements. Methods and improvement techniques.	3	
	Production systems simulation.	3	

	Globalization. Social responsibility. Environment responsibility.	3	
	Concept of planning business based on technology. Revive of technology and innovation in technology.	3	
	Preparing Technology oriented Investment Project (TIP). Evaluation and demonstration TIP. TIP budgeting. Risks and risks reduction TIP.	3	
	List of laboratory or design exercises		LE or DE hours
	Single production. Project management.		2
	Introduction to the Network planning technique.		2
	Time analysis.		2
	CPM method.		2
	PERT method.		2
	PRECEDENCE method.		2
	Cost analysis.		2
	Resource analysis.		2
	Introduction to inventory management.		2
	EOQ and ROP methods.		2
	Probability methods and safety supplies.		2
	JIT method.		2
	Introduction to MRP, MRP-II i ERP.		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	Presence on lectures and exercises at least 70% of the teaching hours. Settled ALL provided laboratory exercises and preparation of terms references.	

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		Independent work	1,5
	Essay		Seminar essay		Laboratory exercises	0,5
	Tests	0	Oral exam		Preparation for laboratory exercises	
	Written exam		Project	2,0	(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 final exam students take the test with parts of matter they did not pass in med terms. Every midterm is a written exam that students write for 45 minutes, and has 5 questions. To have a passing grade students have to gain at least 40% of every midterm. On the other hand, students have a colloquium on the Technique of network planning (LE) through first written colloquium at the end of first semester. • LE – grade for laboratory exercises • M1, M2 – points on mid-term exams The final score (in percentage) is formed according to the formula: Grade(%) = 0,30 LE + 0,7 (M1 + M2)

Required literature	**Title**	**Number of**	**Availability via**

(available in the library and via other media)		**copies in the library**	**other media**
	Dulčić, Ž., Pavić, I., Rovan, M., Veža, I., "Proizvodni management", Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture – Faculty of Economics, Split, 1996.	5	
	Schroeder, R. G., "Upravljanje proizvodnjom", MATE, Zagreb, 1999.	5	
	Veža, I., Bilić, B., Gjeldum, N., Mladineo, M., "Upravljanje projektima", Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture, Split, 2011.		e-learning
Optional literature (at the time of submission of study programme proposal)	Slack, N., Chambers, S., Johnston, R., "Operations Management", Prentice Hall, Harlow, 2004. Wild, R., "Operations Management" Continuum, 2002.		
Quality assurance methods that ensure the acquisition of exit competences	• Tracking the presence on classes • Academic year analyses-grades and exams success • Student survey contain teacher evaluation • Teacher self-evaluation • Graduated student feedback about the relevance of syllabus content		
Other (as the proposer wishes to add)			

NAME OF THE COURSE	PROFESSIONAL TRAINING									
Code	FEXX06	Year of study	3							
Course teacher	Head of the professional training from the Faculty	Credits (ECTS)	5							
Associate teachers	Head of the professional training from the private institution	Type of instruction (number of hours)	L	S	AE	LE	DE			
Status of the course	Elective	Percentage of application of e-learning								
COURSE DESCRIPTION										
Course objectives	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									
Course enrolment requirements and entry competences required for the course	Acquired 120 ECTS credits									
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	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									
Course content broken down in detail by weekly class schedule (syllabus)	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.									
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	Independent work									
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		Research		Practical training	4				
	Experimental work		Report		Independent work					
	Essay		Seminar essay		Report writing	1				
	Tests		Oral exam		(Other)					
	Written exam		Project		(Other)					
Grading and evaluating student work in class and at	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									

<table>
<tr><td>the final exam</td><td colspan="3">the head of professional training from the receiving institution and the head of professional training from the Faculty.</td></tr>
<tr><td rowspan="2">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></td><td></td><td></td></tr>
<tr><td>Optional literature (at the time of submission of study programme proposal)</td><td colspan="3"></td></tr>
<tr><td>Quality assurance methods that ensure the acquisition of exit competences</td><td colspan="3">- Questionnaire on professional training
- Self-evaluation of the head of professional training
- Student survey of the whole study programme</td></tr>
<tr><td>Other (as the proposer wishes to add)</td><td colspan="3"></td></tr>
</table>

NAME OF THE COURSE	QUALITY ASSURANCE						
Code	FETL16	Year of study	1.				
Course teacher	Boženko Bilić, Ph. D., Full Professor	Credits (ECTS)	5				
Associate teachers	Marko Mladineo, Ph. D., Teaching assistant	Type of instruction (number of hours)	L	S	AE	LE	DE
			30	0	15	15	0
Status of the course	Obligatory	Percentage of application of e-learning	0				

COURSE DESCRIPTION

Course objectives	- The promotion of quality as a fundamental criterion for survival companies in the market - Introducing students with modern principles, techniques and methods of quality assurance - Introducing students with the modern systems and principles of quality management.		
Course enrolment requirements and entry competences required for the course	Completed undergraduate study industrial engineering, shipbuilding or mechanical engineering.		
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	Students will be able to: - Distinguish quality control, quality assurance and quality management - Construct a control charts for variables and control charts for attributes - Apply some sampling procedures for inspection by attributes and by variables - Assess the capability of process - Apply the some tools and methods of quality assurance - Explain the establishment and operation of a quality management system - Comment different quality management systems - Evaluate (teamwork) quality management system according to requirements of international standard ISO 9001		
Course content broken down in detail by weekly class schedule (syllabus)	Course content	L hours	AE hours
	INTRODUCTION: Definitions of quality. The historical development of quality. Traditional and modern approach to quality. QUALITY LEVELS: quality control, quality assurance, quality management. QUALITY AND LEGISLATION - Responsibility as a result of poor quality. QUALITY COSTS	2	0
	QUALITY AND RELIABILITY	2	2
	QUALITY CONTROL: Internal and external quality control. On-line quality control and off-line quality control. Basic quality control tools	2	0
	APPLICATION OF THE THEORY OF PROBABILITY AND STATISTICS IN THE QUALITY CONTROL.	2	3
	STATISTICAL PROCESS CONTROL: Variation in process (special causes of variations and common causes of variations). Process capability analysis - process capability indexes	2	2
	STATISTICAL PROCESS CONTROL: Control charts for variables. Control charts for attributes.	2	2
	STATISTICAL QUALITY CONTROL: Acceptance sampling by attributes and by variables.	2	2

	First midterm exam		
	QUALITY ASSURANCE. QUALITY ASSURANCE: Taguchi method. QFD method.	3	2
	QUALITY MANAGEMENT: Seven Management and Planning Tools (7QMT). FMEA method. Six-Sigma.	2	0
	QUALITY MANAGEMENT: Quality and standardization. Standard ISO 9000. Requirements of this International Standard ISO 9001.	2	0
	QUALITY MANAGEMENT: The establishment of quality management systems - Requirements that a company must fulfill. Preparing the necessary documentation. The application of the quality management system	2	0
	QUALITY MANAGEMENT: Internal audit of quality management system. Management review of quality management system. External audit of quality management system conducted by external independent auditing organization.	3	0
	Second midterm exam		

List of laboratory exercises	LE hours
Measurement and control of physical quantities	3
FTA method	2
FMEA method	2
QFD method	2
5S	2
Six sigma	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		Individual work	2,5
	Essay		Seminar essay	0,5	Laboratory exercises	0,5
	Tests		Oral exam		Preparation for laboratory exercises	0
	Written exam		Project		(Other)	

Grading and evaluating student work in class and at the final exam	During semester there are two midterm exams. The first midterm exam is after 7 weeks of lecturing and the second one is after the next 6 weeks. The student can take the first midterm exam if he/she regularly attended classes. Requirements for access to the second midterm exam are: regularly attended classes, at least 25% of points achieved at the first midterm and positively evaluated individual seminar. Midterm exams are conducted in written form. They consist of theoretical questions and numerical problems. The teacher reserves the right to hold a midterm exam in oral form. Positive assessment represents minimal 50% points on each midterm exam: Grade (%) = 0,5 (M1 + M2) M1 – first midterm grade (%), i.e. percentage points achieved on the first midterm M2 – second midterm grade (%), i.e. percentage points achieved on the second midterm Requirements for access to the final exams are: regularly attended classes and

<table>
<tr><td></td><td colspan="3">positively evaluated individual seminar.
In the two final exams students that did not pass at least one of the midterm exams take part. In the third and fourth final exams students take the whole exam regardless results of midterm exams. Final exams are conducted in written form. They consist of theoretical questions and numerical problems. The teacher reserves the right to hold a final exams in oral form. The requirement for passing grade is minimal 50% points on final exam.

Grade (%): Final mark:
50% - 60% sufficient (2)
61% - 75% good (3)
76% - 90% very good (4)
91% - 100% excellent (5)

Grade (%) is average points achieved on midterm exams expressed as a percentage or number of points achieved on the final exam expressed as a percentage.</td></tr>
<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>B. Bilić: Kvaliteta – Planiranje, analiza i upravljanje, University of Split, FESB, 2016.</td><td>5</td><td></td></tr>
<tr><td>I. Oslić: Kvaliteta i poslovna izvrsnost, M.E.P. Consult, Zagreb, 2008.</td><td>0</td><td></td></tr>
<tr><td>N. Vulić: Sustavi upravljanja kvalitetom, Veleučilište u Splitu, Split, 2001.</td><td>0</td><td></td></tr>
<tr><td>N. Injac: Mala enciklopedija kvalitete, I. dio – Upoznajmo normu ISO 9000, Oskar, Zagreb, 2002.</td><td>0</td><td></td></tr>
<tr><td>Optional literature (at the time of submission of study programme proposal)</td><td colspan="3">- B. Bilić: Predavanja postavljena na e-learning portalu
- J. M. Juran, F. M. Gryna: Planiranje i analiza kvalitete, MATE, Zagreb, 1999.
- N. Injac: Mala enciklopedija kvalitete, II. dio – Informacije; dokumentacija; auditi", Oskar, Zagreb, 2002.
- M. Drljača: Mala enciklopedija kvalitete, V dio - Troškovi kvalitete, Oskar, Zagreb, 2004.</td></tr>
<tr><td>Quality assurance methods that ensure the acquisition of exit competences</td><td colspan="3">- Keeping records of the attendance of students
- Annual evaluation of results in accordance with the above learning outcomes
- Feedback from students via surveys
- Self-evaluation of teachers
- Feedback from students who have already graduated related to 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	RATIONAL USE OF ENERGY						
Code	FESM04	Year of study	1				
FESC06	Sandro Nižetić, Ph. D., Associate Professor	Credits (ECTS)	5				
Nižetić Sandro Ivan Tolj Dario Bezmalinović Grubišić-Čabo Filip	Ivan Tolj, Ph. D., Teaching assistant Dario Bezmalinović, Ph. D., Teaching assistant	Type of instruction (number of hours)	L	S	AE	LE	DE
			30	30	0	0	0
	Obligatory	Percentage of application of e-learning					
Obavezni							
Course objectives	Training students for: - Classify and elaborate base terms related to the energy sustainability, - Implement general thermodynamic laws on different energy systems and components, - Classify and elaborate renewable energy sources						
Course enrolment requirements and entry competences required for the course	Thermodynamics, Mathematics 1, Mathematics 2.						
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	Students will be able to: - Consider and clarify basic terms related to the sustainable energy development, - Describe and implement general thermodynamic laws on different energy systems and components in order to compute their efficiency, - Classify and describe unfavourable impacts to the environment due to energy related issues, - Classify and consider implementation of the renewable energy sources, - Determine and describe basic economic parameters related to the energy projects.						
Course content broken down in detail by weekly class schedule (syllabus)	Course content		L or S hours		AE hours		
	Introduction to the process engineering's, basic terms and laws.		2 hours		2 hours		
	Calculation of the energy flows for different properties.		2 hours		2 hours		
	Calculation examples of energy flows for different plants.		2 hours		2 hours		
	Calculation examples of energy flows for different plants.		2 hours		2 hours		
	Enthalpy change and chemical reactions.		2 hours		2 hours		
	Calculation examples of energy flows for different combustion processes, exergy of fuels.		2 hours		2 hours		
	Energy balance equations and exergy analysis.		2 hours		2 hours		
	Exergy analysis.		2 hours		2 hours		
	Heat exchangers.		2 hours		2 hours		

	Pumps and fans in energy systems.	2 hours	2 hours
	Heat pumps.	2 hours	2 hours
	Cogeneration plants.	2 hours	2 hours
	Rational use of renewable energy sources.	2 hours	2 hours
	Rational use of renewable energy sources.	2 hours	2 hours
	Economic analysis for energy related projects.	2 hours	2 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	The presence on lectures in the amount of at least 70 % of the times scheduled. Performed all required auditorium 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	3	Practical training	
	Experimental work		Report		(Other)	
	Essay		Seminar essay		(Other)	
	Tests		Oral exam		(Other)	
	Written exam		Project		(Other)	

Grading and evaluating student work in class and at the final exam			
Required literature (available in the library and via other media)	**Title**	**Number of copies in the library**	**Availability via other media**
	S. Nižetić, online predavanja, Racionalno Korištenje Energije, FESB, 2011.		
	G. Boyle: Renewable energy, power for a sustainalble future, Oxford (2004)	1	
	L.D.D. Harvey, Energy Efficiency and the demand for energy services, 2010.	1	
	F. Bošnjaković: Nauka o toplini (I i II dio), Tehnička knjiga, Zagreb, 1970 i 1976	2	
Optional literature (at the time of submission of study programme	Grupa autora, HVAC Applications, ASHRAE, 2003 Priručnik za energetsko certificiranje zgrada, UNDP, 2010. Grupa autora, ''Energy analysis of 108 industrial processes'' ,U.S. Department of energy, USA, (1997),		

proposal)	Š.Hadžiefendić, A. Lekić, E. Kulić, ''Kogeneracija i alternativne tehnologije proizvodnji električne energije, Bosna, Sarajevo, (2003), S.Kakac, H. Liu, ''Heat exchangers'', CRC Press, New York, (2002), LJ. Majdandžić, ''Obnovljivi izvori energije'', Graphis, Zagreb (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
Other (as the proposer wishes to add)	

NAME OF THE COURSE	REFRIGERATION						
Code	FESL37	Year of study	2				
Course teacher	Nižetić Sandro, Ph. D., Associate Professor	Credits (ECTS)	5				
Associate teachers	Ivan Tolj, Ph. D., Teaching assistant Dario Bezmalinović, Ph. D., Teaching assistant	Type of instruction (number of hours)	L	S	AE	LE	DE
			30	0	30	0	0
Status of the course	Elective.	Percentage of application of e-learning					

COURSE DESCRIPTION

Course objectives	Training students for: - Classify and elaborate basic terms related to the refrigeration, - Implement basic thermodynamic calculations for different cooling systems (applications), - Classify and elaborate different refrigeration techniques and systems in general.		
Course enrolment requirements and entry competences required for the course	Thermodynamics 1, Mathematics 1, Mathematics 2.		
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	Students will be able to: -Consider and elaborate basic terms related to the general refrigeration systems, -Elaborate and implement basic thermodynamic calculations for different refrigeration systems, -Classify and elaborate unfavourable impacts of the refrigerants to the environment, -Describe and classify base equipment of the typical refrigeration system, -Numerate and describe different types of the refrigeration systems.		
Course content broken down in detail by weekly class schedule (syllabus)	Course content	L or S hours	AE hours
	Introduction to the refrigeration.	2 hours	2 hours
	Methods to obtain low temperatures. Idealised cooling cycles.	2 hours	2 hours
	Real cooling cycles cascade cooling cycle, multiple compressor stage cooling cycles, and efficiency improvement of the cooling cycles.	2 hours	2 hours
	Characteristics of the refrigerants, impact to the environment, selection of the refrigerant, retrofit of the refrigerant.	2 hours	2 hours
	Compressor types for cooling applications and base characteristics.	2 hours	2 hours
	Evaporators for cooling applications.	2 hours	2 hours
	Condensers for cooling applications.	2 hours	2 hours

	Other equipment of the refrigeration systems.	2 hours	2 hours
	Regulation of the refrigeration systems (basis).	2 hours	2 hours
	Performance of the refrigeration systems, coolers, air-conditioning devices, ice machines, etc.	2 hours	2 hours
	Different refrigeration systems.	2 hours	2 hours
	Different refrigeration systems.	2 hours	2 hours
	Different refrigeration systems.	2 hours	2 hours
	Introduction to the air-conditioning systems	2 hours	2 hours
	Introduction to the cryogenic techniques.	2 hours	2 hours
	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	The presence on lectures in the amount of at least 70 % of the times scheduled. Performed all required auditorium 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	2	Practical training	
	Experimental work		Report		(Other)	
	Essay		Seminar essay		(Other)	
	Tests		Oral exam		(Other)	
	Written exam		Project	1	(Other)	
Grading and evaluating student work in class and at the final exam						

Required literature (available in the library and via other media)	**Title**	**Number of copies in the library**	**Availability via other media**
	S. Nižetić, Online predavanja: Rashladna tehnika, FESB, 2011.		
	Recknagel, Sprenger, Schramek, Čeperković: Grijanje i klimatizacija 2002, Energetika marketing,		

	Zagreb, 2002 (Prijevod sa njemačkog)		
	ASHRAE Handbooks: Fundamentals, Applications, Systems and Equipment, Refrigeration, ASHRAE, Atlanta, USA, 2012		
Optional literature (at the time of submission of study programme proposal)	- Časopis: EGE, Energetika marketing, Zagreb - Časopis: ASHRAE Journal, ASHRAE, Atlanta, USA.		
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	STRATEGIC MANAGEMENT						
Code	FEVM03	Year of study	1.				
Course teacher	Želimir Dulčić, Phd	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	The objectives of this course include understanding theoretical concepts of strategic management and strategic management process.
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)	Compare and evaluate different strategic management approaches. 1. Analyze the main structural features of an industry. 2. Appraise the resources and capabilities of the firm in terms of their ability to confer sustainable competitive advantage. 3. Demonstrate understanding of the concept of competitive advantage and its sources. 4. Distinguish the two primary types of competitive advantage: cost and differentiation and formulate strategies to create a cost and/or a differentiation advantage. 5. Analyze dynamics in competitive rivalry. 6. Understand the advantages of vertical integration and outsourcing and the factors that determine the relative efficiency of each; make recommendations for horizontal changes in the boundary of the firm based on an understanding of the conditions under which diversification creates value.

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

	Lectures		Exercises	
	Topic	Hours	Topic	Hours
1	Course introduction: course contents, literature and assignments.	2	Opening discussion. Student expectations. Information on the course, requirements and grading.	2
2	Strategic management and strategic management process. Definition of terms.	2	Presentation of selected case studies.	2
3	Environmental analysis. Elements of company's environment. Social environment.	2	Guest appearance by prominent businessmen.	2
4	Industry environment. Internal environment.	2	Analysis of a practical example.	2

	5	Methods and techniques of social environment analysis.	2	Analysis of a practical example.	2
	6	Methods and techniques of industry analysis.	2	Test 1	2
	7	Methods and techniques of internal environment analysis.	2	Presentation of student research papers and practical example.	2
	8	Defining mission, vision and goals.	2	Presentation of student research papers and practical example.	2
	9	Business strategies - types and characteristics.	2	Guest appearance by prominent businessmen.	2
	10	Corporate strategies – types and characteristics.	2	Presentation of selected strategic management books.	2
	11	Strategic corporate social responsibility – characteristics and principles.	2	Presentation of articles and books related to corporate social responsibility.	2
	12	Strategy formulation. Strategic choice.	2	Visiting selected company and presenting its strategic analysis.	2
	13	Strategy implementation – functional strategies.	2	Visiting selected company and presenting propositions for its strategic improvement.	2
	14	Strategy implementation – structure, leadership, culture and reward systems.	2	Test 2	2
	15	Strategic control – processes, types and levels of control.	2	Presentation of practical example from international business practice.	2

Format of instruction	**x lectures** **x seminars and workshops** **x exercises** ☐ *on line* in entirety ☐ partial e-learning **x field work**	**x independent assignments** ☐ multimedia ☐ laboratory ☐ work with mentor ☐ (other)
Student responsibilities	Requirement for taking the exam is 70% of class attendance.	

Screening student work *(name the proportion of ECTS credits for each*	Class attendance	1 ECTS	Research		Practical training	
	Experimental work		Report		Test	2 ECTS*

activity so that the total number of ECTS credits is equal to the ECTS value of the course)	Essay		Seminar essay	2 ECTS	(Other)	
	Tests		Oral exam	1 ECTS	(Other)	
	Written exam	2 ECTS*	Project		(Other)	
Grading and evaluating student work in class and at the final exam	Students have two tests and one team work project during the semester.					

	Title	**Number of copies in the library**	**Availability via other media**
Required literature (available in the library and via other media)	Grant, R.M, Jordan, J.: Foundations of strategy, John Wiley & Sons, West Sussex, 2012.	1	

Optional literature (at the time of submission of study programme proposal)	1. Grant, M. R.: Contemporary Strategy Analysis: Concepts, Techniques, Applications, Blackwell Publishers Inc., Malden, Massachusetts, Third edition, 2001. 2. Barney, J.B.: Gaining and sustaining Competitive Advantage, Pearson, New Jersey, 2011.
Quality assurance methods that ensure the acquisition of exit competences	• Monitoring student's class attendance (teacher) • Class quality supervisions (Vice-Dean) • Analysis of student success (Vice-Dean) • Student survey on the quality of teachers and teaching (University of Split, Centre for Quality Improvement) • Final exam is relevant for the assessment of course outcomes. The content of exam is reassessed periodically in order to assure fit with course outcomes.
Other (as the proposer wishes to add)	

NAME OF THE COURSE	SUSTAINABLE PRODUCTION						
Code	FETM08	Year of study	2.				
Course teacher	Dražen Bajić, Ph. D., Full Professor Branko Klarin, Ph. D., Full Professor	Credits (ECTS)	5				
Associate teachers	Sonja Jozić, Ph. D., Assistant Professor Mario Veić, Teaching assistant	Type of instruction (number of hours)	L	S	AE	LE	DE
			30	0	15	15	0
Status of the course	Obligatory	Percentage of application of e-learning	10%				

COURSE DESCRIPTION			
Course objectives	Training students for: - Understanding and use of basic knowledge of sustainable production in which the development of products and services takes place using processes and systems that do not pollute the environment, - Set aside and suggest the type and implementation of sustainable systems that conserve energy and natural resources, ensuring the safety and health of workers, or products, - Develop sensitivity and responsibility towards employees, society and customers.		
Course enrolment requirements and entry competences required for the course			
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	Students will be able to: - Evaluate the product life cycle and production process, - Establish and propose modern manufacturing technology, - Relate and devise ways of rational use of energy, - Select and sort out suitable solutions for sustainable energy production, - Evaluate and recommend methods and procedures suitable processing of various materials, - To present the principles of sustainable production, - Analyze alternative cooling techniques, - Comment modern materials for cutting tools, - Compare additive technology and CNC machining in order to rapid prototyping and tooling, - To analyze the possibilities of material machining high hardness.		
Course content broken down in detail by weekly class schedule (syllabus)	Course content	L or S hours	AE hours
	Introduction to sustainable production and historical development of the concept, principles of sustainable production, sustainable production problems.	2	
	Life cycle assessment of the product and production process.	2	
	Energy efficiency. Rational use of energy. New technologies. The circular economy.	2	
	Sustainable production of energy. Energy losses and insulation. Centralized and Distributed Systems.	2	
	Efficient use of material resources, materials in the environment, sustainable transport. Sustainable production trends.	2	
	Clean manufacturing and clean technologies, Kyoto and other protocols.	2	
	Sustainable production and consumption of food, fisheries, organic production. Sustainable forest management and	2	

	sustainable production of wood.		
	Energy production and energy losses.		2
	Energy efficiency and rational use of energy.		2
	Examples of sustainability from nature – biomimicry.		2
	Eco-innovation concepts.		2
	The sustainability of transportation systems.		2
	The consequences of unsustainable system and climate change.		2
	Circular Economy and New Technologies.		2
	First midterm exam		
	Modern production technology. Classification, Features.	2	
	Overview and features modern materials for cutting tools,significance and problems with recycling the coolant.	2	
	High speed without or with minimal use of coolantt. High dynamic CNC machines.	2	
	Machining of hard aterials, hard turning and milling. Economic analysis of the applicability of procedures as an alternative to grinding.	2	
	Alternative cooling techniques (krioegena, MQL, HKHZ).	2	
	Rapid prototyping and tooling.	2	
	Second midterm exam		
	List of laboratory or design exercises		LE or DE hours
	Sustainable development of production engineering. Hardmaching – Experimental investigation		2
	Comparative experimental study of different machining conditions - surface roughness.		2
	Comparative experimental study of different machining conditions - tool wear.		2
	Comparative experimental study of different machining conditions - cutting forces.		2
	The sustainability of product development by using reverse engineering - Catia V5 RE and 3D printing.		2
	The sustainability of product development by using reverse engineering - Catia V5 RE and CNC.		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	1	Laboratory exercises	
	Tests		Oral exam		Preparation for laboratory exercises	
	Written exam		Project		(Other)	
Grading and evaluating student work in class and at the final exam	There are two midterms of final exams. The first midterm exam is after 7 weeks of lecturing and the second one is after the next 6 weeks. The first mid-term consists of a seminar essay presenting, in which students need to process a given topic in the field of sustainable production. Work is assessed according to the criteria of					

<table>
<tr><td></td><td colspan="3">absolute evaluation. Second midterm test is carried out as written test. In the final exams students that did not pass the midterm exams take part. The final exams are carried out as seminar essays grade (first part) or written test (second part). The requirement for passing grade is the positive grade of each part. Grade (in percentage) is formed according to the formula:
Grade(%) = 0,5 (M1 + M2)
where in percentage:
• M1, M2 – seminar essay and written test grade.</td></tr>
<tr><td rowspan="7">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>- Klarin B.: Sustainable energy – Part 1. Introduction, authorized lectures, FESB</td><td></td><td>e-learning portal</td></tr>
<tr><td>- Bajić D.: authorized lectures, FESB</td><td></td><td>e-learning portal</td></tr>
<tr><td>- Niemann, J.; Tichkiewitch, S.; Westkämper: Design of Sustainable Product Life Cycles, Springer Verlag, 2009.</td><td></td><td>book</td></tr>
<tr><td>- Fiksel, J.: A Guide to Sustainable Product Development: Eco-Efficient Product Development and Sustainable Production, Mc.Graw-Hill, 2009.</td><td></td><td>book</td></tr>
<tr><td>- Youssef, H. A., El-Hofy, H.; Machining Technology: Machine Tools and Operations, CRC Press, Taylor and Francis Group, 2008.</td><td></td><td>book</td></tr>
<tr><td>- Dixit U. S., Sarma, D. K., Paulo Davim J.; Environmentally Friendly Machining, SpringerBriefs in Applied Sciences and Technology, Springer, 2012.</td><td></td><td>book</td></tr>
<tr><td>Optional literature (at the time of submission of study programme proposal)</td><td colspan="3">- Bernard A., Tichkiewitch S.: Design of Sustainable Product Life Cycles, Springer Verlag, 2009
- Cheremisinoff, N.: Handbook of Cleaner Production, Elsevier, 2009</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">- Feedback from graduate students about the course relevance</td></tr>
</table>

NAME OF THE COURSE	TECHNICAL INNOVATIONS						
Code	FESL40	Year of study	1.				
Course teacher	Branko Klarin, Ph. D., Full Professor	Credits (ECTS)	5				
Associate teachers	Goran Gašparović, Teaching assistant	Type of instruction (number of hours)	L	S	AE	LE	DE
			30	0	30	0	0
Status of the course	Elective	Percentage of application of e-learning	0				

COURSE DESCRIPTION			
Course objectives	Training students for: - acquire knowledge and understanding of the innovation processes, - application and analysis of procedures for the creative work of interest for technical applications, - evaluation procedures and intellectual property protection, - implement and lead the innovation process from idea to patent.		
Course enrolment requirements and entry competences required for the course	English language		
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	Students will be able to: - recognize the importance of innovation mainly technical, in the development of human society, - evaluate and self-evaluate of innovation potential, - recognize the importance of innovation in different technical fields, - appoint institutions and intellectual property organisations, - link and select the parameters important for innovation, - identify steps to innovate and design of project tasks, - connect various sources of ideas and design ideas, to design their own innovation, - recognize steps and design patent applications, create own patent applications.		
Course content broken down in detail by weekly class schedule (syllabus)	Course content	L or S hours	AE hours
	Introduction. Etymology and basic definitions. The history and role of invention and innovation.	2	2
	Great explorers and inventors. Examples of the invention. The most significant inventions and innovations.	2	2
	Innovative potential innovators. Basics for evaluation and self-assessment.	2	2
	The implications of innovation in the research, management and policy. Indexation and the Global Innovation Index.	2	2
	Institutions and intellectual property organization.	2	2
	Basics for personal innovative work and membership in associations of innovators.	2	2
	Innovation processes and outcomes.	2	2
	Systematic innovation and design. The design spiral.	2	2
	Association, diffusion of innovation, the S-curve and other features.	2	2
	Eco-innovation and sustainability.	2	2
	Review of the EU attitude and incentives to innovation. Open innovation.	2	2
	Legal aspects of intellectual property protection and realization.	2	2

	Protected and protective symbols. Copyright, trademark, patent license.	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	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	3,5	Research		Practical training	
	Experimental work		Report		Individual work	
	Essay		Seminar essay	1,5	Laboratory exercises	
	Tests		Oral exam		Preparation for laboratory exercises	
	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 consists of seminar essay progress. In the final exams students that did not pass the midterm exams take part. The final exams are carried out as finished seminar essay acceptance. The requirement for passing grade is the positive grade of seminar essay. Grade (in percentage) is formed according to the formula: Grade(%) = 0,5 (M1 + M2) where in percentage: • M1, M2 – seminar essay status.

Required literature (available in the library and via other media)	**Title**	**Number of copies in the library**	**Availability via other media**
	- Klarin B.: Inovacije u tehnici, autorizirana predavanja, FESB		e-learning portal
	- Von Hippel, Eric: The Sources of Innovation, Oxford University Press, 1988.		book
	- Tuomi, Ilkka: Networks of Innovation – Change and Meaning in the Age of the Internet, Oxford University Press, 2002.		book

Optional literature (at the time of submission of study programme proposal)	- Bray, D.A.; Konsynski, B.; Streator, J.: Being a Systems Innovator, National Defense University - Information Resources Management College, 2007. - Europe 2020. Flagship Initiative Innovation Union, 2010.

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)	- Feedback from graduate students about the course relevance

NAME OF THE COURSE	THERMAL MACHINES						
Code	FESM01	Year of study	1.				
Course teacher	Gojmir Radica, Ph. D., Full Professor	Credits (ECTS)	5				
Associate teachers	Dario Bezmalinović, Ph. D., Teaching assistant Ivan Tolj, Ph. D.,Teaching assistant, Tino Sumić, Teaching assistant	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 of basic principles of internal combustion engines and compressors, - setting up and solving thermodynamic and design parameters of IC engines, - permanent adoption and deepening of knowledge in the field of IC engines.		
Course enrolment requirements and entry competences required for the course	Thermodynamics, Fluid Mechanics		
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	Students will be able to: - identify different types of thermal machines, - calculate basic design and performance parameters of internal combustion engines and compressors, - analyze the energy transformation in thermal machines and its dependence on basic working and dimensional characteristics of the process, - select a heat engine for the particular system based on its energy characteristics, - analyze exhaust gas emissions and reduction methods, - critical analysis of techno-economic estimates for the power plant.		
Course content broken down in detail by weekly class schedule (syllabus)	Course content	L or S hours	AE hours
	Introduction to thermal machines. Brief history of thermal machines. Internal combustion engines definition. Description of system and engine parts.	2	1
	Design and operating parameters. Brake power and torque. Indicated work. Mechanical efficiency.	2	1
	Mean effective pressure. Specific fuel consumption. Air excess ratio. Volumetric efficiency. Emissions. Power. Torque..	2	1
	IC Engine working cycles. Otto cycle. Diesel cycle. Sabathė cycle. Two stroke. Four stroke.	2	1
	Inlet and exhaust systems. Diesel fuel systems. Direct and indirect injection systems. Fuel characteristics.	2	1
	Otto engines - fuel systems.	2	1
	Gas engines.Power plants.	2	1

	Scavenging. Turbocharging. Turbocharger design and characteristics.	2	1
	Classification and application of compressors. Thermodynamic fundamentals of single- and multi-stage compressor operation. Compressor power consumption.	2	1
	Reciprocating compressors, design and constructive features. Calculation and design of single- and multi-stage reciprocating compressors. Dynamics of a reciprocating mechanism.	2	1
	Suction and discharge valves of reciprocating compressors. Ideal and actual capacity. Capacity control. Efficiency.	2	1
	Screw compressors, constructive features, capacities and control. Scroll compressors, constructive features capacities and control. Vane compressors.	2	1
	Turbo compressors, constructive features, performance and control..	2	1
	List of laboratory or design exercises		LE or DE hours
	Engine parts, technical specification.		2
	Engine constructive and operating parameters. Testing.		3
	Brake power and torque. Indicated work. Efficiency. Fuel consumption. Maintenance and diagnostic.		3
	Emission measuring and analysing		3
	Compressor parts, technical specification, characteristics.		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	2	Research		Practical training	
	Experimental work		Report		(Other)	2,7
	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	There are two midterms and final exams. The first midterm exam is after 7 weeks of lecturing and the second one is after the next 6 weeks. In the final exams students that did not pass the midterm exams take part. The midterm and final exams are carried out as written tests (oral exam-if necessary). The requirement for passing grade is the positive assessment of exercises and 50 % points for theory and exam on each midterm exam or the final exam. Grade (in percentage) is formed according to the formula: Grade(%) = 0,54 (M1 + M2) the activities in percentage: • M1, M2 – test results.

<table>
<tr><td></td><td colspan="3"></td></tr>
<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>Radica G.: Predavanja iz predmeta Toplinski strojevi</td><td></td><td>e-learning portal</td></tr>
<tr><td>Grljušić M.:" Motori s unutrašnjim izgaranjem", Sveučilište u Splitu, FESB, 2000</td><td>5</td><td></td></tr>
<tr><td>Fabris O., Grljušić M.:" Kompresori", Sveučilište u Splitu, FESB, 2009.</td><td>5</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">1.Stone R.:" Introduction to Internal Combustion Engines", University of Oxford, PALGRAVE, N.Y., 1999.
2.Jeras D.:" Klipni motori-uređaji", Školska knjiga, Zagreb, 1992.
3.Andrassy M.:" Kompresori", FSB, Sveučilište u Zagrebu, 2001.
4 J.H. Horlock, D.E Winterbone The Thermodynamics and gas dynamic of internal-combustion engines, , Oxford, 1986.
5. J. B. Heywood: Internal combustion engines fundamentals, McGraw-Hill, 1988</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	TOOLS AND FIXTURES						
Code	FETL20	Year of study	2				
Course teacher	Branimir Lela, Ph. D., Assistant Professor	Credits (ECTS)	5				
Associate teachers		Type of instruction (number of hours)	L	S	AE	LE	DE
			30	0	0	0	30
Status of the course	Elective	Percentage of application of e-learning	0%				

COURSE DESCRIPTION

Course objectives	Training students for: - Learning basic knowledge on selection and design of tools and fixtures in production practice in casting, deformation and machining technologies - Acquiring expert knowledge in design, calculation, production and implementation of tools and fixtures in production technologies		
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: - categorize tools and fixtures in production technologies - make diagrams of loads and stresses of tools during exploitation - select materials and standard machine elements during design tools and fixtures - develop a tool or fixture for making products using various production technologies - design a tool or fixture - calculate main elements of tools and fixtures - discuss on proposed design solutions with arguments - determine economic feasibility of tools and fixtures application		
Course content broken down in detail by weekly class schedule (syllabus)	Course content	L hours	AE hours
	Introduction; Basic concepts and definition of tools	2	/
	Tools for casting	2	/
	Tools for cold forming	2	/
	Tools for forging	2	/
	Tools for hot extrusion	2	/
	Tools for rolling	2	/
	Tools for sheet metal processing	2	/
	First midterm exam		
	Tools for machining processes	2	/
	Basic concepts and definition of fixtures	2	/
	Guidelines for fixtures design	2	/
	Tolerances and position of the workpiece in fixtures	2	/
	Elements fixtures and design of fixtures	2	/
	Developing of fixtures and determining the price of fixtures	2	/
	Second midterm exam		
	List of design exercises		DE hours
	Each student get an assignment to design a tool or fixture that must be resolved during the semester. Design exercises are held two hours a week where students receive instructions for solving their assignments in		30

<table>
<tr><td></td><td colspan="6">the design sense.</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">Presence at the lectures at least 70% and at the laboratory exercise 100% of the time scheduled. Preparation and submission of seminar 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>1</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>2</td><td>Laboratory exercises</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></td><td></td><td></td><td></td><td></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 there are two midterms and final exams. First midterm exam is after 7 weeks and the second is after 15 weeks of lectures. On final exams students take the exam of those parts of the course content that are not passed on midterms.
Every student gets an assignment in design that have to be completed during the semester.
The requirements for a positive grade are 50% points on each midterm and positive grade from seminar work.

Grade is forming in accordance with the following formula:
Grade (%)=M1/4 + M2/4+PG/2
or
Grade (%)=ZI/2+PG/2
M1, M2 – score on midterms in percentage (%)
PG – seminar work grade (%)
ZI – score on final exam (%)
Grading policy:
Percentage Grade
50% do 61% sufficient (2)
62% do 74% good (3)
75% do 87% very good (4)
88% do 100% excellent (5)
Students who do not pass midterms attend regularly scheduled final exam which has written and oral part.
Students whose seminar work is rated at least very good (4) may on midterms and final exam score less than 50% but not less than 25%. In that case final score of the course is a grade obtained on seminar work.

Examination terms: according to the timetable</td></tr>
<tr><td rowspan="4">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">Duplančić, I., Lela, B., "Alati i naprave", autorizirana predavanja, FESB</td><td></td><td>e-learning portal</td></tr>
<tr><td colspan="3">Magdić, S. Rebec, B., "Štance I i II", Sveučilište u Zagrebu, Zagreb 1968.</td><td></td><td></td></tr>
<tr><td colspan="3">Rebec, B., "Naprave", Sveučilište u Zagrebu, Zagreb 1972.</td><td></td><td></td></tr>
</table>

	Grizelj, B., "Alati i naprave" , Sveučilište u Osijeku, Slavonski Brod, 2004.		
Optional literature (at the time of submission of study programme proposal)	– Boljanovic, V., Paquin, J.R., Crowley, R.E., "DieDesign Fundamentals", IndustrialPressInc., 2005. – Čuš F., "Vpenjalne priprave za procese odrezavanja", Univerza u Mariboru, Maribor, 2004.		
Quality assurance methods that ensure the acquisition of exit competences	- Keeping records of class attendance - Evaluation of results in accordance with the learning outcomes - Feedback from students via surveys - Self-evaluation of teachers		
Other (as the proposer wishes to add)			

NAME OF THE COURSE	TRANSPORT SYSTEMS						
Code	FESM10	Year of study	1				
Course teacher	Tonči Piršić, Ph. D., Associate Professor	Credits (ECTS)	5				
Associate teachers		Type of instruction (number of hours)	L	S	AE	LE	DE
			30	0	30	0	0
Status of the course	Obligatory	Percentage of application of e-learning	40%				

COURSE DESCRIPTION

Course objectives	Training students for: -		
Course enrolment requirements and entry competences required for the course	Technical Drawings, Mechanics, Strength of Materials, Machine Elements		
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	Students will be able to: - Ability of designing the transport systems in industry.		
Course content broken down in detail by weekly class schedule (syllabus)	Course content	L or S hours	AE hours
	Division of transportation systems due to working principle and transported material.	2	
	Purpose and working area of transportation systems.	3	
	Maintenance cost. Material properties and choice of transportation system.	3	
	Mechanical transport with pulling elements.	2	
	Mechanical transport without pulling elements.	2	
	Cranes.	8	
	Conveyors.	2	
	Elevators. Lifts. Scrappers.	2	
	Gravity transporters.	2	
	Hydraulic transport. Pneumatic transport. Pressure vessels.	2	
	List of laboratory or design exercises		LE or DE hours
	Construction and modelling of crane driving winch		28
Format of instruction	☒ lectures	☐ independent assignments	

	☐ seminars and workshops ☒exercises ☐ *on line* in entirety ☐ partial e-learning ☐ field work	☐ 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		(Other)	
	Essay		Seminar essay		(Other)	
	Tests	1	Oral exam		(Other)	
	Written exam	2	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.		
Required literature (available in the library and via other media)	**Title**	**Number of copies in the library**	**Availability via other media**
	1. T. Piršić: "Transport u industriji", FESB – Split, 2005.		
	2. J. Serdar: "Prenosila i dizala", Tehnička knjiga, Zagreb, 1983.		
	3. H. I. Shapiro, J. P. Shapiro, L. K. Shapiro: "Cranes and Dericks", McGraw – Hill Professional, 1999.		
	4. D. Šćap: "Prenosila i dizala, podloge za konstrukciju i proračun", Sveučilišna naklada Liber, Zagreb, 1988.		
	5. Tehnička enciklopedija, 6. tom, Leksikografski zavod Miroslav Krleža, Zagreb, 1988.		
Optional literature (at the time of submission of study programme proposal)	1. S. Dedijer: "Osnovi transportnih uređaja", Građevinska knjiga, Beograd, 1978. 2. M. A. Alspaugh, R. O. Bailey: "Bulk Material Handling by Conveyor Belt", Society for Mining Metalurgy & Exploration, 1996.		
Quality assurance methods that ensure the acquisition of exit competences	- Lectures responsible for the same subject area collaborate closely and monitor each other's work. Occassional class observations and appraisal by Head of Department		
Other (as the proposer wishes to add)			

3. STUDY PERFORMANCE CONDITIONS

3.1. Places of the study performance

Buildings of the constituent part (name existing, under construction and planned buildings)	
Identification of building	FESB
Location of building	R. Boškovića 32
Year of completion	1980. phase 1, 2008. phase 2
Total square area in m^2	29.477

3.2. List of teachers and associate teachers

Course	Teachers and associate teachers
Automation	Jadranka Marasović, Ph. D., Full Professor Josip Eterović, Teaching Assistant
Computer Aided Design 2	Gojko Magazinović, Ph. D., Full Professor Ivan Pivac, Teaching Assistant
Croatian Economy	Željko Mrnjavac, Ph. D., Full Professor Lana Kordić, Ph. D., Assistant Professor Blanka Šimundić, Ph. D., Teaching Assistant
Design For Assembly	Nikola Gjeldum, Ph.D. Assistant Professor Marina Crnjac, Teaching Assistant, Ivan Peko, Teaching Assistant
Diploma Thesis	
Economic Treatment Of Materials	Nedjeljko Mišina, Ph.D., Full Professor
Evaluation of Industrial Projects	Damir Vučina, Ph. D., Full Professor, Željan Lozina, Ph. D., Full Professor Marija Šiško Kuliš, Ph. D., Associate Professor Igor Pehnec, Ph. D., Teaching Assistant
Hydraulic and pneumatic systems	Jani Barle, Ph. D., Full Professor Alen Kovač, Teaching Assistant
Information Systems for PLM	Stipo Čelar, Ph. D., Associate Professor
Machine Tools And Systems	Dražen Bajić, Ph. D., Full Professor Sonja Jozić, Ph. D., Assistant Professor Mario Veić, Teaching Assistant
Maintenance Management	Jani Barle, Ph. D., Full Professor Stipe Perišić, Teaching Assistant
Management of Human Resources	Srećko Goić, Ph. D., Full Professor Danica Bakotić, Ph. D., Associate Professor Ivana Tadić, Ph. D., Assistant Professor
Management of PLM Projects	Ivica Veža, Ph. D., Full Professor Marko Mladineo, Ph. D., Teaching Assistant

Marketing	Biljana Crnjak-Karanović, Ph. D., Full Professor Goran Dedić, Ph. D., Assistant Professor Zoran Mihanović, Ph. D., Assistant Professor
Optimization Methods 1	Zoran Babić, Ph. D., Full Professor Branka Marasović, Ph. D.,Assistant Professor
Optimization methods 2	Damir Vučina, Ph. D., Full Professor Igor Pehnec, Ph. D., Assistant Professor Ivo Marinić- Kragić, Teaching Assistant
Plant Layout	Ivica Veža, Ph. D., Full Professor Marko Mladineo, Ph. D., Teaching Assistant
Principles Of Manufacturing Process Design	Boženko Bilić, Ph.D. Full Professor Nikola Gjeldum, Ph.D. Assistant Professor Ivan Peko, Teaching Assistant.
Product Development and Management	Lovre Krstulović-Opara, Ph. D., Full Professor
Product Lifecycle Management	Jani Barle, Ph.D., Full Professor Boženko Bilić, Ph. Full Professor Marko Mladineo, Ph.D., Teaching Assistant
Production Management	Ivica Veža, Ph. D., Full Professor Marko Mladineo, Ph. D., Teaching Assistant
Professional Training	Head of the professional training from the Faculty Head of the professional training from the private institution
Quality Assurance	Boženko Bilić, Ph. Full Professor Marko Mladineo, Ph.D., Teaching Assistant
Rational Use Of Energy	Sandro Nižetić, Ph. D., Associate Professor Ivan Tolj, Ph. D., Teaching Assistant Dario Bezmalinović, Ph. D., Teaching Assistant
Refrigeration	Sandro Nižetić , Ph. D., Associate Professor Ivan Tolj, Ph. D., Teaching Assistant Dario Bezmalinović, Ph. D., Teaching Assistant Filip Grubišić-Čabo, Teaching Assistant
Strategic Management	Želimir Dulčić, Ph. D., Full Professor Anita Talaja, Ph. D., Assistant Professor
Sustainable Production	Dražen Bajić, Ph. D., Full Professor Branko Klarin, Ph. D., Full Professor Sonja Jozić, Ph. D., Assistant Professor Mario Veić, Teaching Assistant
Technical Innovations	Branko Klarin, Ph. D., Full Professor
Thermal Machines	Gojmir Radica, Ph. D., Full Professor Dario Bezmalinović, Ph. D., Teaching Assistant Ivan Tolj, Ph. D.,Teaching Assistant, Tino Sumić, Teaching Assistant
Tools And Fixtures	Branimir Lela, Ph. D., Assistent Professor
Transport Systems	Tonči Piršić, Ph. D., Associate Professor

3.3. Curriculum vitae of the course teacher

First and last name and title of teacher	**Zoran Babić, Ph. D., Full Professor.**
The course he/she teaches in the proposed study programme	Optimization Methods 1
GENERAL INFORMATION ON COURSE TEACHER	
Address	Rendićeva 26, 21000 Split
Telephone number	+385/21/430-645
E-mail address	babic@efst.hr
Personal web page	
Year of birth	1948.
Scientist ID	001262
Research or art rank, and date of last rank appointment	Şcientific Adviser , may 2002.
Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment	Senior Full Professor, 30.06.2006.
Area and field of election into research or art rank	Area of social sciences, field of Economics, branch Quantitative methods in economics
INFORMATION ON CURRENT EMPLOYMENT	
Institution where employed	Faculty of Economics, Split
Date of employment	01.02.1976.
Name of position (professor, researcher, associate teacher, etc.)	Professor
Field of research	Quantitative Methods in Economics and Business
Function	Member of the Quantitative Methods Department
INFORMATION ON EDUCATION – Highest degree earned	
Degree	Ph D. in Social sciences, Field of economics, Branch of Quantitative Methods
Institution	University od Split, Faculty of Economis
Place	Split
Date	April, 1991.
INFORMATION ON ADDITIONAL TRAINING	
Year	2002.
Place	Stoke on Trent, Velika Britanija
Institution	Staffordshire University
Field of training	Curriculums of Decision Theory and Quantitative Methods
Year	1992.
Place	Bologna
Institution	Instituto SINNEA and Faculty of Economics, Split
Field of training	Quantitative Methods
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, 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. Quantitative methods in businesss, Doctoral study at the faculty of Economics, Split 2. Operations Research, FESB 3. Linear Programming, 3. year of study, Faculty of natural sciences (Mathematics), Split 4. Quantitative methods in management, 3. year of study, Faculty of Economics, Split 5. Business Decision Making, 4. year of study, Faculty of Economics, Split
Authorship of university/faculty textbooks in the field of the course	1. Z. Babić: ***Linearno programiranje*,** University of Split textbook (p. 306) Faculty of Economics, Split, 2010. 2. Z. Babić: ***Modeli i metode poslovnog odlučivanja***, University of Split textbook, (p. 333), Faculty of Economics, Split, 2011.
Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)	1. T. Perić, Z. Babić, I. Veža: ***Vendor Selection and Supply Quantities Determination in a Bakery by AHP and Fuzzy Multi-Criteria Programming***, International Journal for Computer Integrated Manufacturing, Vol. 26, Issue 9, 2013. p. 816-829. 2. Z. Babić, T. Perić: ***Volume Discounts in Multiproduct Supplier Selection Problem - Multi-Criteria Approach***, Proceedings of the 12th International Symposium on Operations Research, SOR '13, Dolenjske Toplice, Slovenia, p. 177-182. 3. Z. Babić, T. Perić(2014): ***Multiproduct Vendor Selection with Volume Discounts as the Fuzzy Multi-Objective Programming Problem***, International Journal of Production Research, Vol 52. No 14, p. 4315-4331. 4. T. Poklepović, Z. Babić (2015): ***Stock selection using a hybrid MCDM approach***, Croatian Operational Research Review, Vol. 5, No. 2, 273-290. 5. Z. Babić, T. Perić (2015**): A New Linearization Approach for Solving Multi Objective Linear Fractional Programming Problem**, Proceedings of the 13th International Symposium on Operations Research, SOR '15, Bled, Slovenia, p. 265-270.
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. HRZZ Research Projects **"Innovative Smart Enterprise" (*IP -11 - 2013*).** Leader: prof. dr. sc. Ivica Veža 2. **Let's Study Together,** IPA project from 2013. in the context of international competition "Integration of disadvantaged groups in regular education system", Faculty of Economics, University of Split (IPA 4.1.2.2.02.02.c11). Leader: prof. dr. sc. Marko Hell.
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?	Since 1976 participates in teaching at the Faculty of Economics at the various courses of the Department of quantitative methods. In independent evaluations conducted by the University of Split, his teaching on various courses was regularly evaluated by excellent marks (average score of greater than 4.5 on a scale of

	1 (poor) to 5 (excellent)). This confirms his methodological-psychological-didactic - pedagogical competences.
PRIZES AND AWARDS, STUDENT EVALUATION	
Prizes and awards for teaching and scholarly/artistic work	2015. The price "Frane Bulić" from Slobodna Dalmacija for lifetime achievement in science 2014. – The price for lifetime achievement for the overall scientific and educational work and contribution to the development and promotion of the reputation of the Faculty of Economics at home and abroad 2010. – Recognition for successful organization 13th International Conference on Operational Research-KOI 2010 (Faculty of Economics, Split) as the president of Croatian society for Operations Research .
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)	In independent evaluations conducted by the University of Split, his teaching on various courses was regularly evaluated by excellent marks (average score of greater than 4.5 on a scale of 1 (poor) to 5 (excellent)).

First and last name and title of teacher	**Dražen Bajić, Ph. D., Full Professor**
The course he/she teaches in the proposed study programme	Machine tools and systems (270) Sustainable production (272)
GENERAL INFORMATION ON COURSE TEACHER	
Address	Julija Klovića 16 B, 21000 Split
Telephone number	091 430 59 31
E-mail address	dbajic@fesb.hr
Personal web page	
Year of birth	1965.
Scientist ID	186 194
Research or art rank, and date of last rank appointment	Scientific Adviser, 12/4/2006
Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment	Senior Full Professor, 25/1/2013
Area and field of election into research or art rank	Technical Sciences, Mechanical engineering
INFORMATION ON CURRENT EMPLOYMENT	
Institution where employed	Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture
Date of employment	15/7/1991
Name of position (professor, researcher, associate teacher, etc.)	Professor
Field of research	Manufacturing engineering, machining, machine tools
Function	Head of Chair of Mechanical Engineering Technology
INFORMATION ON EDUCATION – Highest degree earned	
Degree	PhD
Institution	University of Zagreb, Faculty of Mechanical Engineering and Naval Architecture
Place	Zagreb
Date	17/4/2000
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)	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)	**Undergraduate study:** 1. Technology 2 (150) 2. Technology 2 (130) **Graduate study:** 1. Computer aided manufacturing (261,262,263)

	2. Machine tools (261, 263) **Professional study:** 1. Machining and machine tools (530) 2. Computer aided manufacturing (530) 3. Manufacturing processes (540) **Postgraduate study:** 1. Modern machining processes (330) 2. Rapid manufacturing (330)
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. Jozić, Sonja; Bajić, Dražen; Celent, Luka. Application of compressed cold air cooling: achieving multiple performance characteristics in end milling process. // Journal of cleaner production. 100 (2015) , /; 325-332 2. Jozić, Sonja; Bajić, Dražen; Stoić, Antun. *Flank wear and surface roughness in end milling of hardened steel* // Metalurgija. 54 (2015), 2; 343-346. 3. Jozić, Sonja; Lela, Branimir; Bajić, Dražen. A New Mathematical Model for Flank Wear Prediction Using Functional Data Analysis Methodology. // Advances in Materials Science and Engineering. 2014 (2014) ; 1-8 4. Jozić, Sonja; Bajić, Dražen; Samardzić, Ivan. Contribution to the assessment of economic viability of hard milling process. Tehnički vjesnik: znanstveno-stručni časopis tehničkih fakulteta Sveučilišta u Osijeku (1330-3651) 21 (2014), 6; 1329-1336. 5. Bajić, Dražen; Celent Luka; Jozić, Sonja. *Modeling of the influence of cutting parameters of the surface roughness, tool wear and cutting force in face milling in off-line process control*. // Strojniški vestnik – Journal of Mechanical Engineering. 58 (2012), 11; 673-682
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)	- Bajić, D., Celent, L., Jozić, S., Design and 3D printing of bottles for designing of bottling plant, (Ordered by: Viloet Logistics Ltd., Obrež Zelinski), Split, 2013. - Bajić, D., Celent, L., Jozić, S., Design and manufacture of molds for steering of student formula (Ordered by: UPS, Split), Split, 2012 - Bajić (PL), I. Veža, B. Bilić, S. Jozić, L. Celent, N. Koboević. High speed machining research, Ministry of science, education and sport, Croatia, - 2012
The name of the programme and the volume in which the main teacher passed exams in/acquired the methodological-psychological-didactic-pedagogical group of competences?-pedagoške kompetencije?	
PRIZES AND AWARDS, STUDENT EVALUATION	
Prizes and awards for teaching and scholarly/artistic work	- Gold medal and plaque for innovation "Planning and optimization of manufacturing system by using simulation" at the Spring Exhibition of Inventions INOVA'95 Zagreb, 1995. - Jubilee plaques and medals Croatian Association of

	Production Engineering for outstanding contribution to the work of HUPS's, and for the benefit of scientific and economic development of the Republic of Croatia, Zagreb, 2000. - Gold Medal Croatian Association of Production Engineering for Outstanding Contribution to the work of HUPS's, and for the benefit of scientific and economic development of the Republic of Croatia, Zagreb, 2003. - Gold Medal Croatian Association of Production Engineering for Outstanding Contribution to the work of HUPS's, and for the benefit of scientific and economic development of the Republic of Croatia, Zagreb, 2005
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	**Jani Barle, Ph. D., Full Professor**
The course he/she teaches in the proposed study programme	- Maintenance Management - Product Lifecycle Management
GENERAL INFORMATION ON COURSE TEACHER	
Address	Žnjanska 4, 21000 Split, HR a
Telephone number	+385 (21) 305930
E-mail address	Jani.Barle@fesb.hr
Personal web page	https://nastava.fesb.hr/nastava/nastavnici/detalji/barle
Year of birth	1964
Scientist ID	186172
Research or art rank, and date of last rank appointment	Scientific Adviser, May 2011.
Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment	Senior Full Professor, September 2016.
Area and field of election into research or art rank	Mechanical engineering, mechanical construction engineering
INFORMATION ON CURRENT EMPLOYMENT	
Institution where employed	University of Split, Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture
Date of employment	July 1991.
Name of position (professor, researcher, associate teacher, etc.)	Professor
Field of research	Process Automation, System Maintenance Management
Function	Education and research
INFORMATION ON EDUCATION – Highest degree earned	
Degree	Ph.D.
Institution	University of Zagreb, Faculty of Mechanical Engineering and Naval Architecture
Place	HR - Zagreb
Date	January 1998.
INFORMATION ON ADDITIONAL TRAINING	
Year	1996.
Place	IT - Padua
Institution	Dipartimento di Ingegneria Meccanica
Field of training	Research on experimental methods
MOTHER TONGUE AND FOREIGN 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)	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)	On Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture <u>Undergraduate study:</u> - Industrial process control (FETC06)

	Master's degree study: - Hydraulics and pneumatics(FETL17) - Maintenance management (FETL04) Doctorate degree study: - Experimental methods (FETU24) - Reliability engineering (FETU14)
Authorship of university/faculty textbooks in the field of the course	Barle, J.: Reliability in maintenance management, (student handbook in Croatian: *Pouzdanost u funkciji održavanja tehničkih sustava*), FESB, Split, 2009
Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)	1. Barle, Jani; Đukić, Predrag; Ban, Dario. Verification of Number of Cycles for Fatique Life Estimation of Wind-Sensitive Structures // 7th ICCSM / Croatian Society of Mechanics, 2012. 233-234. 2. Barle, Jani; Wolf, Hinko; Đukić, Predrag. Experimental verification of the dynamic model for a wind turbine tower // 30th Danubia-Adria: Symposium on Advances in Experimental Mechanics / Croatian Society of Mechanics, 2013. 219-220 3. Grubišić, Vatroslav; Barle, Jani. Procedure for the Service Strength Approval of the Drillship Derricks. // Rad Hrvatske akademije znanosti i umjetnosti. Tehničke znanosti. 521 (2015), 17; 51-62. 4. Đukić, Predrag; Wolf, Hinko; Jani, Barle. Simple dynamic model of wind turbine tower with experimental verification. // International journal for engineering modelling. 28 (2015) , 1-4; 49-59
Professional and scholarly articles published in the last five years in subjects of teaching methodology and teaching quality (5 works at most)	1. Barle, Jani; Franulović, Marina; Jurčević Lulić, Tanja; Kladarić, Ivica; Markučič, Damir; Radica, Gojmir. *Izrada kataloga znanja, vještina i kompetencija za studije strojarstva u Republici Hrvatsko*j // Zbornik radova međunarodne stručne konferencije ME4CataLOgue / Kozak, D., Barle, J., Markučič, D., Pavletić, D., Matičević, G, Vranešević M. N., Rosandić, Ž, Damjanović, D. (ur.)., Sl.Brod 2015. 2. "*Hrvatski katalog znanja, vještina i kompetencija za studije strojarstva zasnovan na ishodima učenja (za preddiplomski, diplomski i doktorski studij)*", Strojarski fakultet u Slavonskom Brodu Sveučilišta J. J. Strossmayera u Osijeku, 2015., Kozak, D., Barle, J., Boras, I., Franulović,, M., Jurčević-Lulić, T., Kladarić, I., Lelas, D., Markučić, D., Matičević, G., Pavletić, D., Vranešević-Marinić, N.(ur.), ISBN 978-953-6048-78-6
Professional, science and artistic projects in the field of the course carried out in the last five years (5 at most)	
The name of the programme and the volume in which the main teacher passed exams in/acquired the methodological-psychological-didactic-pedagogical group of competences?-pedagoške kompetencije?	IPA IV project ME4CataLOgue “Further development and implementation of the Croatian Qualifications Framework (CQF)”, 2013-2015.
PRIZES AND AWARDS, STUDENT EVALUATION	
Prizes and awards for teaching and scholarly/artistic work	
Results of student evaluation taken in the last five years for the course that is comparable to the course	

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

First and last name and title of teacher	**Boženko Bilić, Ph. D., Full Professor**
The course he/she teaches in the proposed study programme	Principles of Manufacturing Process Design Quality Assurance Product Lifecycle Management
GENERAL INFORMATION ON COURSE TEACHER	
Address	Makarska ulica 2, 21000 Split, HR
Telephone number	+385 21 410 810
E-mail address	bbilic@fesb.hr
Personal web page	
Year of birth	1962.
Scientist ID	154905
Research or art rank, and date of last rank appointment	Scientific Adviser, 12/04/2006
Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment	Senior Full Professor, 25/01/2013
Area and field of election into research or art rank	Technical Sciences, Field Mechanical engineering
INFORMATION ON CURRENT EMPLOYMENT	
Institution where employed	Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture
Date of employment	1/10/1987
Name of position (professor, researcher, associate teacher, etc.)	Professor
Field of research	Production engineering and organization of production
Function	
INFORMATION ON EDUCATION – Highest degree earned	
Degree	Ph.D.
Institution	Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture
Place	Split
Date	30/6/2000
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)	Germany (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)	Vast experience in teaching these courses.

Authorship of university/faculty textbooks in the field of the course	1. Bilić, B., *Kvaliteta – Planiranje, analiza i upravljanje* (sveučilišni udžbenik, ISBN 978-953-290-058-3), Sveučilište u Splitu, Fakultet elektrotehnike, strojarstva i brodogradnje, Split, 2016. 2. Veža, I., Bilić, B., Bajić, D., *Projektiranje proizvodnih sustava*, (e-udžbenik, recenzent prof. dr. sc. Roko Cebalo), Split, 2001.
Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)	1. Banduka, N., Veža, I., Bilić, B., *An integrated lean approach to Process Failure Mode and Effect Analysis (PFMEA): A case study from automotive industry*, Advances in Production Engineering & Management, (ISSN 1854-6250), 11 (4), 2016., str. 355-365 2. Gjeldum, N. Bilić, B., Veža, I., *Investigation and modelling of process parameters and workpiece dimensions influence on material removal rate in CWEDT process*, International Journal of Computer Integrated Manufacturing, (ISSN 0951-192X), 28 (7), 2015., str. 715-728 3. Bilić, B., Petej, P., Grubelić, G., *Estimation of reliability and availability of technical system using Monte Carlo simulation*, Proceedings of the 18th International Conference – Maintenance/Instandhaltung 2012, (ISSN 1848-4867), str. 125-132, Šibenik, 2012. 4. Bilić, B., Trlin, G., Vojković, V., *Application of simulated annealing method in the cutting parameters optimization regarding surface roughness*, Proceedings of the 11th International Scientific Conference - MMA 2012: Advanced Production Technologies, (ISBN 978-86-7892-429-3), str. 9-12, Novi Sad, 2012. 5. Bilić, B., Jurjević, M., Barle, J., *Procjena pouzdanosti tehničkog sustava primjenom Markovljevih modela i sustavne dinamike*, Strojarstvo, (ISSN 0562-1887), 52 (3), 2010., str. 271-281
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. Innovative smart enterprise (INSENT), HRZZ, 2014.-2018. 2. Network of Innovative Learning Factories NIL, "System - Learning Factory", FESB, Split, University of Reutlingen, 2014.-2016. 3. LEONARDO DA VINCI Project "LOPEC - Logistics personnel excellence by continuous self-assessment", FESB Split, University of Reutlingen, 2013.-2014. 4. Project TEMPUS-2008-IT-JPCR 144 959, Master Study Program in Product Lifecycle Management with Sustainable Production, 2008.-2013.
The name of the programme and the volume in which the main teacher passed exams in/acquired the methodological-psychological-didactic-pedagogical group of competences?-pedagoške kompetencije?	Training for teachers and administrative staff in the EU project ME4CataLOgue Croatian Catalogue of knowledge, skills and competences for mechanical engineering studies (Bachelor, Master and Doctoral study programmes) based on learning outcomes, Split, 2014
PRIZES AND AWARDS, STUDENT EVALUATION	
Prizes and awards for teaching and scholarly/artistic work	1. Croatian Association of Production Engineering – gold medal, Zagreb, 2005. 2. Innovation Fair INOVA'95 - Gold medal and a plaque for

	innovation “Production system planning and optimization by using simulation”, Zagreb, 1995.
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)	Principles of Process Planning: 3,9 Quality Assurance: 4.1 Product Lifecycle Management: 4,7

First and last name and title of teacher	**Biljana Crnjak Karanović, Ph. D. Professor**	
The course he/she teaches in the proposed study programme	Marketing	
GENERAL INFORMATION ON COURSE TEACHER		
Address	Put Firula 8, 21000 Split, HR	
Telephone number	+385 21 430 652	
E-mail address	bcrnjak@efst.hr	
Personal web page	www.efst.hr/~...	
Year of birth	1954	
Scientist ID	115860	
Research or art rank, and date of last rank appointment	Scientific Counselor, May, 4, 2006	
Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment	Senior Full Professor, May, 12, 2011	
Area and field of election into research or art rank	Social Sciences – Economics (PhD)	
INFORMATION ON CURRENT EMPLOYMENT		
Institution where employed	University of Split, Faculty of Economics	
Date of employment	September, 1, 1982	
Name of position (professor, researcher, associate teacher, etc.)	Professor	
Field of research	Marketing, International Marketing, Global Marketing Strategies	
Function	Director of Postgraduate Studies in Business	
INFORMATION ON EDUCATION – Highest degree earned		
Degree	PhD	
Institution	Zagreb-Faculty of Economics and Business, University of Zagreb	
Place	Zagreb	
Date	December, 23, 1997	
INFORMATION ON ADDITIONAL TRAINING		
Year	2016,	2013, 2012
Place	Aveiro	Berlin
Institution	University of Aveiro	Institute for Cultural Diplomacy
Field of training	International Marketing	Globalisation; Cultural Diplomacy
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)	Macedonian (5)	
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)	**University of Split – Faculty of Economics** - Marketing (undergraduate), from 1991 - Marketing management (graduate) from 2000 - International Marketing (graduate) from 1991 - Marketing management (Post-graduate) from 2005 - Marketing theory (PhD) from 2005	

	University of Zagreb – Faculty of Economics (till 2008) - Price management in B2B marketing (Post-graduate) **University of Rijeka – Faculty of Economics** (till 2008) - Global marketing strategies (Post-graduate)
Authorship of university/faculty textbooks in the field of the course	Crnjak.Karanović, B., Miočević, D., Osnove međunarodnog marketinga, University Textbook, Sveučilište u Splitu Ekonomski fakultet, 2013 Split,. 288 pages, ISBN 978-953-281-053-0
Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)	1. Kvasina, A, Crnjak-Karanovic, B., Dorotić, M., Internationalization Process of Firms: Guidelines for Croatian SMEs, 24th CRMAR Congress, Marketing Theory and Practice, Building Bridges and Fostering Collaborattion, Proceedings, pp. 139-165, University of Split, Faculty of Economics, 2015, Ed., M. Mihic, ISBN: 978-953-281-067-7 2. Pecotic,A., Crnjak-Karanovic,B., Dedic, G., Regionalisation, Heredity and Sense of Place, in IDENTITET JADRANSKOG PROSTORA HRVATSKE: RETROSPEKT I PROSPEKT, Sveučilište u Splitu Ekonomski fakultet, 2012 Split, ISBN 978-953-281-046-2, pp. 1-10, Ed., B. Crnjak.Karanovic, et al 3. Vickov,D., Crnjak-Karanovic, B., Identitet i imidž Hrvatske kao destinacije za direktna strana ulaganja, in IDENTITET JADRANSKOG PROSTORA HRVATSKE: RETROSPEKT I PROSPEKT, Sveučilište u Splitu Ekonomski fakultet, 2012 Split, ISBN 978-953-281-046-2, pp. 139-158, Ed., B. Crnjak.Karanovic, et al 4. Renko, N., Crnjak-Karanovic, B., Matic, A., Influence of Consumer Ethnocentrism on Purchase Intensions: Case of Croatia, Ekonomska Misao i praksa, 2012, Vol 2, pp. 529-5445. 5. Miocević, D., Crnjak-Karanović, B., The Export Market Orientation: Export Performance Relationship in Emerging Markets - The Case of Croatian SME Exporters, p. 107-122, International Journal of Business and Emerging Markets, Inderscience Publishers, Geneva, 2012, ISBN 1753-6219, Vol 4/2
Professional and scholarly articles published in the last five years in subjects of teaching methodology and teaching quality (5 works at most)	Biljana Crnjak-Karanović, Preporuke za sadržajne inovacije studija Poslovne ekonomije - smjer Marketing // Preporuke za inovaciju studijskih programa iz ekonomije i poslovne ekonomije na temelju ishoda učenja ECONQUAL / Host, Alen; Alfirević Nikša (ur.), Split: Ekonomski fakultet Sveučilišta u Splitu, 2016. pp. 125-133.
Professional, science and artistic projects in the field of the course carried out in the last five years (5 at most)	1. Crnjak-Karanović, B., Šeric, N., Miočević, D., Proizvodi, kupci, tržište, pp1-47, Mogućnosti restrukturiranja Aluminij d.d. Mostar, Kružić, D., (Ed)., Sveučilište u Splitu Ekonomski fakultet, 2013 Split, ISBN 978-953-281-051-6 2. Crnjak-Karanović, B., Šerić, N., Miočević, D., Očekivana kretanja na prodajnom tržištu, Mogućnosti restrukturiranja Aluminij d.d. Mostar, Kruzic, D (Ed)., Sveučilište u Splitu Ekonomski fakultet, 2013 Split,pp 129-144. ISBN 978-953-281-051-6 3. Crnjak-Karanović, B., Šerić, N., Miočević, D., Očekivana kretanja na nabavnim tržištima, Mogućnosti restrukturiranja Aluminij d.d. Mostar, Kružić, D (Ed).,

	Sveučilište u Splitu Ekonomski fakultet, 2013 Split,pp144-160, ISBN 978-953-281-051-6
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	• Award for the University textbook, Faculty of Economics, University of Split; 2013 • *Fedor Rocco Award* – University of Zagreb – Faculty of Economics, Best article in the area of Marketing; 2013 • Award for the Book – one of authors, Faculty of economics, University of Split; 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)	4,1 - 4,9

First and last name and title of teacher	**Stipo Čelar, Ph.D., Associate Professor**
The course he/she teaches in the proposed study programme	Information Systems for PLM
GENERAL INFORMATION ON COURSE TEACHER	
Address	Vrboran 45
Telephone number	+385 21 305 843
E-mail address	stipe.celar@fesb.hr
Personal web page	https://nastava.fesb.hr/nastava/nastavnici/detalji/scelar
Year of birth	1967
Scientist ID	297890
Research or art rank, and date of last rank appointment	Senior Research Associate, 14/03/2014
Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment	Associate Professor 20/09/2016
Area and field of election into research or art rank	• Technical science, Field Computer science (*senior research associate*) • Technical science, Field Basic techn.science (*research associate*)
INFORMATION ON CURRENT EMPLOYMENT	
Institution where employed	University of Split, FESB
Date of employment	01/01/2008
Name of position (professor, researcher, associate teacher, etc.)	Associate Professor
Field of research	Software engineering, Information systems
Function	
INFORMATION ON EDUCATION – Highest degree earned	
Degree	Ph.D.
Institution	Technische Universität Wien
Place	Vienna, Austria
Date	28/08/1997
INFORMATION ON ADDITIONAL TRAINING	
Year	2009.
Place	Paderborn, Germany
Institution	Fakultät für Elektrotechnik, Informatik und Mathematik, Universität Paderborn
Field of training	Software engineering
MOTHER TONGUE AND FOREIGN LANGUAGES	
Mother tongue	Croatian
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	German 5
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)	Russian 3
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	Slovak 2
COMPETENCES FOR THE COURSE	
Earlier experience as course	Information Systems Design, University of Mostar FSR,

teacher of similar courses (name title of course, study programme where it is/was offered, and level of study programme)	Graduate 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. Dragicevic, Srdjana; Celar, Stipe; Turic, Mili. Bayesian network model for task effort estimation in agile software development. // *Journal of systems and software*. 127 (2017) ; 109-119. 2. Celar, Stipe; Mudnic, Eugen; Seremet, Zeljko. State-of-the-art of messaging for distributed computing systems // *Procedia Engineering* / Katalinic, B. (ur.). Mostar : Elsevier & DAAAM, 2016. 298-307. 3. Vicković, Linda; Gotovac, Sven; Čelar, Stipo. Simulation-Based Performance Analysis of the ALICE Mass Storage System. // *International journal of simulation modelling*. 15 (2016) , 1; 70-82. 4. Celar, Stipe; Stojkic, Zeljko; Seremet, Zeljko; Marusic, Zeljko; Zelenika, Danijel. Classification of test documents based on handwritten student id's characteristics // *Procedia Engineering*, Volume 100-2015 / B. Katalinic (ur.). Beč : Elsevier, 2015. 782-790. 5. Dragičević, Srđana; Čelar, Stipo. Method for Elicitation, Documentation and Validation of Software User Requirements (MEDoV) // Proceedings of 18th IEEE International Symposium on Computers and Communications (ISCC 2013). 2013, IEEE, 2013, 956-961.
Professional and scholarly articles published in the last five years in subjects of teaching methodology and teaching quality (5 works at most)	1. Čelar, Stipe; Turić, Mili; Dragičević, Srdjana; Veža, Ivica. Digital Learning Factory at FESB – University of Split // *ZBORNIK RADOVA YU INFO 2016* / Prof. dr. Miodrag Ivković (ur.). Beograd : Društvo za informacione sisteme i računarske mreže, 2016. 001-006. 2. Klarin, Karmen; Čelar Stipo. Knowledge representation in the ontological engineering using conceptual modeling and graph- based reasoning // Contemporary Issues in Economy and Technology - CIET 2016. Split : University of Split, University Department of Professional Studies, 2016. S-153-S-164. 3. Klarin, Karmen; Čelar, Stipo. Modeling information resources and application using ontological engineering // WSCAR 2015 / Rachid Sammouda (ur.). Rim, Italy : IEEE, 2015. 1-6. 4. Klarin, Karmen; Čelar, Stipo. Ontology-based knowledge management approach for information system development // Proceedings of Papers / George Paunovic (ur.). Beograd : IEEE, 2013. 805-808.
Professional, science and artistic projects in the field of the course carried out in the last five years (5 at most)	1. INSENT – INovative Smart ENTerprise (HRZZ-1355), 2014 – 2018 (znanstveni projekt HRZZ) 2. Plan-PRO, Softver za planiranje proizvodnje, 2015 – 2016 (tehnologijski projekt, SDŽ) 3. VENIO FIN – Programsko rješenje za računovodstvo i financije primjenom .NET tehnologija, 2014 – 2015 (tehnologijski projekt, SDŽ) 4. PIVIS Projekt – Informatizacija MIB Pivac, 2010 - danas (stručni projekt) 5. VENIO indicium – start up i spin off, 2011 – danas, (stručni projekt)

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?	In October 1995. Prof. Stipe Čelar graduated in philosophy at the University of Zagreb.
PRIZES AND AWARDS, STUDENT EVALUATION	
Prizes and awards for teaching and scholarly/artistic work	1. In 1994 Prof. Stipe Čelar received a scholarship "Bertha von Suttner" from the Ministry of Science and Research of the Republic of Austria for his Ph.D. research at the Department of Intelligent Manufacturing Systems at the Vienna University of Technology (TU Wien), Austria. 2. In 2009 Prof. Stipe Čelar received the Jubilee Gold Medal of DAAAM International Vienna
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	**Nikola Gjeldum, Ph. D., Assistant Professor**
The course he/she teaches in the proposed study programme	Design for Assembly
GENERAL INFORMATION ON COURSE TEACHER	
Address	Mosećka 6, Split, Hrvatska
Telephone number	+385914305934
E-mail address	nikola.gjeldum@fesb.hr
Personal web page	http://marjan.fesb.hr/~ngjeldum/
Year of birth	1979
Scientist ID	287306
Research or art rank, and date of last rank appointment	Senior Research Associate, 20/3/2011
Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment	Assistant Professor, 15/6/2016
Area and field of election into research or art rank	Technical Sciences, Field Mechanical engineering
INFORMATION ON CURRENT EMPLOYMENT	
Institution where employed	University of Split, Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture
Date of employment	14/5/2006
Name of position (professor, researcher, associate teacher, etc.)	Assistant professor
Field of research	Manufacturing technology, production organization, plant layout, design for manufacturing and assembly
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	25/02/2011
INFORMATION ON ADDITIONAL TRAINING	
Year	2009
Place	Aachen, Germany
Institution	RWTH WZL Aachen
Field of training	Optimization of manufacturing processes and product design for manufacturability
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) (very good)
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	Manufacturing process planning Mechanical engineering 1. year of graduate study

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. Gjeldum, Nikola; Bilić, Boženko; Kujundžić, Fabris. Application of modified value stream mapping tool for restructuring of make-to-order production system // CIM 2013 : Computer Integrated Manufacturing and High Speed Machining / Abele, Eberhard ; Udiljak, Toma ; Ciglar, Damir (ur.). Zagreb : Croatian Association of Production Engineering, 2013. 113-118 2. Gjeldum, Nikola; Veža, Ivica; Beram Žana. Design Tool For Solar Panels Product Customization // Proceedings of the 5th International Conference on Mass Customization and Personalization in Central Europe (MCP-CE 2012) / Anišić, Zoran ; Freund, Robert (ur.). Novi Sad : Faculty of Technical Sciences in Novi Sad, 2012. 82-87 3. Gjeldum, Nikola; Veža, Ivica; Bilić, Boženko. Simulation of production process reorganized with value stream mapping. // Tehnički vjesnik : znanstveno-stručni časopis tehničkih fakulteta Sveučilišta u Osijeku. 18 (2011) , 3; 341-347 4. Štefanić, Nedeljko; Gjeldum, Nikola; Mikac, Tonči. Lean Concept Application in Production Busines. // Technical Gazzete, Tehnički vjesnik : znanstveno-stručni časopis tehničkih fakulteta Sveučilišta u Osijeku. 17 (2010) , 3; 353-356
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)	Collaboration with industry – implementation of production reorganizationimplementacija, improvement of production and assembly processes and products: FEAL d.o.o. Široki Brijeg, Bosnia and Herzegovina, - production and assebbly of alluminium parts DALSTROJ d.d. production and assembly of winches BRODOTROGIR d.d. shipyard KONČAR – production and assembly of power transformers
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	Scientific award Festo: Young researcher and scientist support scolarship, kao autoru nagrađenog rada, dodijeljena na 19. DAAAM International Symposium on Intelligent Manufacturing & Automation, Trnavi, Slovakia, 22-25.10.2008.
Results of student evaluation taken in the last five years for the course	4,9 University of Split, Department for quality assurance

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	**prof. dr. sc. Srećko Goić**
The course he/she teaches in the proposed study programme	Human Resources Management
GENERAL INFORMATION ON COURSE TEACHER	
Address	Tolija 56, 21412 Pučišća
Telephone number	091/7958540
E-mail address	goic@efst.hr
Personal web page	
Year of birth	1959.
Scientist ID	111242
Research or art rank, and date of last rank appointment	Scientific Advisor, December 2007.
Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment	Full Professor, tenured, 25.01.2013.
Area and field of election into research or art rank	Social sciences. scientific field of Economics, branch of Management and Organization
INFORMATION ON CURRENT EMPLOYMENT	
Institution where employed	Faculty of Economics, University of Split
Date of employment	March 1982.
Name of position (professor, researcher, associate teacher, etc.)	Full Professor
Field of research	Management, Humane Resources Management
Function	
INFORMATION ON EDUCATION – Highest degree earned	
Degree	Ph.D. in social, humanistic, and theological sciences, field of Economics
Institution	Faculty of Economics, University of Zagreb
Place	Zagreb
Date	1996.
INFORMATION ON ADDITIONAL TRAINING	
Year	2011
Place	Newcastle, UK
Institution	Newcastle University
Field of training	'Principles and practices for developing Learning to Learn across the phases'
Year	2011
Place	Aberdeen, Scotland
Institution	University of Aberdeen
Field of training	visiting scholar
Year	2011
Place	Ljubljana Slovenia
Institution	Faculty of Economics, Ljubljana University
Field of training	visiting lecturer within the frame of ERASMUS programme
Year	2013
Place	Ancona, Italy
Institution	Faculty of Economics, Universita Politecnica delle Marche
Field of training	visiting lecturer within the frame of ERASMUS programme
Year	2014
Place	Poitiers, France
Institution	Poitiers University
Field of training	'Teaching skills and lifelong training for lecturer-researchers:

	why and how '
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 - 4
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	French - 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)	• Since 1998 he has been introducing and teaching the subject of 'Human Resource Management' at the undergraduate study programme, and since the academic year 2006/07 in the professional study programme too; • With the introduction of new programs by the Bologna system, from 2005/6 till today he is also the holder and lecturer of subjects: 'Business Communication' at the undergraduate university and professional programme, 'Business Planning' at the undergraduate university and professional programme, 'Human Resource Management' undergraduate university and professional programme, the subject of 'Strategic Human Resource Management' at the Graduate Study, and the subject of 'Organization and Human Resource Management (on Projects)' at a specialist graduate professional study programme. • He is the holder and teacher of the subject 'Human Resources Management Economics' and the subject of 'Organizational Communication' at the Postgraduate Specialist Study in Business Economics at the Faculty of Economics, Split since 2006. • The co-holder and teacher of the course 'Project Management', and the subject 'Entrepreneurial Project' at the Postgraduate Specialist Study in Business Economics at the Faculty of Economics, Split since 2006. • He is the holder and teacher of the subject 'Human Resources Management Economics', Postgraduate Doctoral Program of Business Economics at the Faculty of Economics and Business Split since 2006. • He is the holder and teacher of the subject 'Human Resources Management Economics' and co-holder and teacher of the course 'Project Management' at the joint postgraduate specialist studies at the Business Economics of the Faculty of Economics Split and the Faculty of Economics of the University of Mostar since 2006.
Authorship of university/faculty textbooks in the field of the course	- with Mr.sc. Nikša Alfirević: skripta ***'Management - slučajevi i zadaci za vježbe'***, Ekonomski fakultet Split, 1997. (reviewer prof. M.Buble). - coauthor: skripta ***'Poduzetnička radionica: Od poduzetničke ideje do izrade poslovnog plana'***,

	Ekonomski fakultet Split, 2005, 2006, 2007., (editor: Dr.sc. D.Kružić; reviewer prof. Ž. Dulčić).
Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)	- Goić, S;.Tadić, I., **"Upravljanje ljudskim resursima na projektima unapređenja poslovnih procesa"**, in: Buble, M. (ed.). ***Utjecaj organizacijskih varijabli na uspjeh programa unapređenja poslovnih procesa,*** Sveučilište u Splitu, Ekonomski fakultet, Split, (2010). pp. 179-195., - Goić, S; Jones, D., **"Do innovative workplace practices foster mutual gains? Evidence from Croatia"**, in T. Kato (ed.): ***Advances in the Economic Analysis of Participatory & Labor-Managed Firms, Volume 11***, Emerald Group Publishing Limited, (2010), pp. 23 – 68., - Goić, S., "Employee Financial Participation in Croatian Enterprises: A Recent Study". ***Global Business & Economics Anthology***. II, 1 (2011); pp. 244-254. - Goić, S., Žunić, A., "**Factors Influencing Employee Satisfaction: Empirical Study in a Large Manufacturing Enterprise**", ***Advances in Business-Related Scientific Research Conference 2012*** (ABSRC 2012), March 28–30, 2012, Venice, Italy; Full Text on CD ROM - Goić, S., "Organizational structure, organizational dynamics, and organizational culture: a research from croatian enterprises", ***Active Citizenship by Knowledge Management & Innovation ; Proceedings of the Management, Knowledge and Learning International Conference 2013***, Proceedings, Bangkok, Celje, Lublin: ToKnowPress, 2013. pp. 47-56. - Goić, S., Planinić, M., "**Investments in Employees: Attitudes and Practices in Croatian Enterprises** ", ***MakeLearn 2014: Human Capital without Borders; Knowledge and Learning for Quality of Life****; Proceedings of the Management, Knowledge and Learning International Conference 25–27 June 2014, Portorož, Slovenia*, Proceedings, Bangkok, Celje, Lublin: ToKnowPress, 2014.; pp. 1289-1298. - Goić, S., "**Impact of Mobbing on Health and Absenteeism among Nurses**", Referred Proceedings of the 13th International Conference of the Society for Global Business and Economic Development ***Managing the "Intangibles": Business and Entrepreneurship Perspectives in a Global Context,*** Ancona – Italy, July 16-18, 2014; pp. 359–370
Professional and scholarly articles published in the last five years in subjects of teaching methodology and teaching quality (5 works at most)	Web pages as the support for teaching from the following subjects: - **Business Communication** - Undergraduate Study (https://moodle.efst.hr/course/view.php?id=45) - The pages are posted in the school year 2009/10 and are actively used until today; - **Human Resource Management** - Undergraduate Study (https://moodle.efst.hr/course/view.php?id=40) - The pages are posted in the school year 2009/10 and are actively used until today; - **Business Planning** - Undergraduate Study (https://moodle.efst.hr/course/view.php?id=37) - The pages are posted in the school year 2009/10 and are actively used until today; - **Strategic Human Resource Management** - graduate study (https://moodle.efst.hr/course/view.php?id=39) - pages are posted in the school year 2009/10 and are actively used up to

	date. - **Organization and Management of Human Resources** - Specialist Graduate Study (https://moodle.efst.hr/course/view.php?id=22) - The pages are posted in the school year 2009/10 and are actively used until today.
Professional, science and artistic projects in the field of the course carried out in the last five years (5 at most)	- Chief researcher on the project MZOŠ ***"Uloga ljudskih resursa u izvođenju projekata unapređenja poslovnih procesa",*** MZOŠ RH, (2007-2012.) - EU Project: "***Assessing and Benchmarking Financial Participation in the EU 25***" (agreement ref. No. VS/2006/0770); project head: Dr. Jens Lowitzsch, 2007.-2009. - EU Project: "***Development and Implementation of Common Bachelor´s Degree programme in the European Context*** (DICBDPEC)"; (Project No: 510570-LLP-1-2010-1-SK-ERASMUS-ECDSP; Grant Agreement: 2010-3909/001-00), project head: prof. dr. Laura Gressnerová, 2011-2013. - EU Project: "***MARKT/2013/019/F: Implementation of the Pilot Project – Promotion of Employee Ownership and Participation***", European University Viadrina Frankfurt-on-Oder and Inter-University Centre at the Free University of Berlin, 2013. - "Analiza poslovanja Trajektne luke Split d.d. u razdoblju 2003-2012 s posebnim naglaskom na utjecaj tarifnog sustava na mogućnost normalnog poslovanja", Ekonomski fakultet Split, 2013. 115 pp. - "**Ekonomsko-financijska utemeljenost traženja Izvođača na izgradnji Luke Gaženica – Zadar**", Ekonomski fakultet Split, 2013. 88 pp.
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.	- more than 30 years of teaching at the University - a series of professional training programs (listed above).
PRIZES AND AWARDS, STUDENT EVALUATION	
Prizes and awards for teaching and scholarly/artistic work	

First and last name and title of teacher	**Sonja Jozić, Ph. D., Assistant Professor**
The course he/she teaches in the proposed study programme	Machine tools and systems
GENERAL INFORMATION ON COURSE TEACHER	
Address	Sibovica 10, Kaštel Lukšić
Telephone number	091 4305 914
E-mail address	sjozic@fesb.hr
Personal web page	
Year of birth	1967.
Scientist ID	297785
Research or art rank, and date of last rank appointment	Research Associate, 04.07.2012.
Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment	Assistant Professor, 19.12.2012.
Area and field of election into research or art rank	Technical Science, Mechanical Engineering
INFORMATION ON CURRENT EMPLOYMENT	
Institution where employed	University of Split, Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture
Date of employment	01.10.2007.
Name of position (professor, researcher, associate teacher, etc.)	Assistant Professor
Field of research	Manufacturing Engineering, Metal Cutting Processes, Computer Aided Manufacturing
Function	
INFORMATION ON EDUCATION – Highest degree earned	
Degree	PhD
Institution	University of Split, Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture
Place	Split
Date	15.02.2012.
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)	German 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	**Undergraduate studies:** 3. Tehnology 1 (130) **Undergraduate professional studies:** 1. Computer aided manufacturing (530)

study programme)	**Graduate studies:** 1. Computer aided manufacturing (261,262,263) 2. Nonconventional machining processes (261,262, 263) 3. Machine tools (261, 263) **Postraduate doctoral studies:** 1. Optimization of machining processes (330)
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. Jozić, Sonja; Bajić, Dražen; Celent, Luka. **Application of compressed cold air cooling: achieving multiple performance characteristics in end milling process**. // Journal of cleaner production. 100 (2015) , /; 325-332 (paper, scientific). 2. Jozić, Sonja; Lela, Branimir; Bajić, Dražen. A New **Mathematical Model for Flank Wear Prediction Using Functional Data Analysis Methodology**. // Advances in Materials Science and Engineering. 2014 (2014) ; 1-8 (paper, scientific). 3. Jozić, Sonja; Bajić, Dražen; Stoić, Antun. **Flank wear and surface roughness in end milling of hardened steel**. // Metalurgija. 54 (2015) , 2; 343-346 (paper, scientific). 4. Celent, Luka; Bajić, Dražen; Jozić, Sonja. **Application of reverse engineering process in mould manufacturing industry** // Mechanical technologies and structural materials, 2011, Split, Croatia, pp. 29-32. (lecture, international review, published work, scientific)
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. Bajić, D., Celent, L., Jozić, S., Projektiranje tehnologije i izrada kalupa za proizvodnju medicinske obuće, (Naručitelj; Dr. Luigi d.o.o., Šestanovac), Split 2015. 2. Bajić, D., Celent, L., Jozić, S., Konstrukcija i izrada modela za proizvodnju ribarskog pribora, (Naručitelj; DTD d.o.o., Dugi rat) Split, 2014. 3. Bajić, D., Celent, L., Jozić, S., Konstruiranje i 3D tiskanje modela boca za projektiranje punionice, (Naručitelj: Logistika Violeta d.o.o. Sveti Ivan Zelina), Split, 2013. 4. Bajić, D., Celent, L., Jozić, S., Konstrukcija i izrada kalupa za upravljač studentske formule, (Naručitelj: UPS, Split), Split, 2012. Bajić, D., Celent, L., Jozić, S., Izrada kočionog sustava student formule primjenom 3D tiska, (Naručitelj: UPS, Split), Split, 2012.
The name of the programme and the volume in which the main teacher passed exams in/acquired the methodological-psychological-didactic-pedagogical group of competences?-pedagoške kompetencije?	Training for teachers and administrative staff within the EU Project ME4CataLOgue, Split, 2014. The program of additional pedagogical psychological education, University of Split, Faculty of Science, 1999.
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	**Branko Klarin, Ph. D., Full Professor**
The course he/she teaches in the proposed study programme	Sustainable production Technical innovations
GENERAL INFORMATION ON COURSE TEACHER	
Address	A. Hebranga 7, 23000 Zadar
Telephone number	091-6305950
E-mail address	Branko.Klarin@fesb.hr
Personal web page	www.fesb.hr/~bklarin
Year of birth	1962.
Scientist ID	3118339
Research or art rank, and date of last rank appointment	Scientific advisor, 11.05.2011.
Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment	Professor, 17.02.2016.
Area and field of election into research or art rank	Technical sciences, machine engineering
INFORMATION ON CURRENT EMPLOYMENT	
Institution where employed	Fakultet elektrotehnike, strojarstva i brodogradnje - Split
Date of employment	01.06.1991.
Name of position (professor, researcher, associate teacher, etc.)	Professor
Field of research	Renewable energy systems
Function	
INFORMATION ON EDUCATION – Highest degree earned	
Degree	D.sc.
Institution	Fakultet elektrotehnike, strojarstva i brodogradnje - Split
Place	Split
Date	03.12.2004.
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)	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)	
Authorship of university/faculty textbooks in the field of the course	Sustainable production, 1. Part – Introduction, on-line course (on Croatian)

Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)	1. Ninić, Neven; Klarin, Branko; Tolj, Ivan. *Hybrid wind-power-distillation plant*. // Thermal Science. 16 (2012) , 1; 249-259 2. Klarin, Branko; Dalia Milić Kralj, *Wing sails for hybrid propulsion of the ships* // International Congress Energy and the Environment Opatija 2014, Rijeka, 2014. 339-350 3. Garafulić, E.; Klarin, B.: *Prihvatljivi način pohrane ugljikovog dioksida U Republici Hrvatskoj*, Tehnički vjesnik, 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)	
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?	ME4CataLOgue – Croatian catalogue of knowledge, skills and competences for mechine engineering studies based on learning outcomes – Training for teachers and administrative personel
PRIZES AND AWARDS, STUDENT EVALUATION	
Prizes and awards for teaching and scholarly/artistic work	
Results of student evaluation taken in the last five years for the course that is comparable to the course described in the form (evaluation organizer, average grade, note on grading scale and course evaluated)	4.8/5 Dean's acknowledgement for best ranked 10% teachers in institution

First and last name and title of teacher	**Lana Kordić, PhD**
The course he/she teaches in the proposed study programme	Croatian Economy
GENERAL INFORMATION ON COURSE TEACHER	
Address	Cvite Fiskovića 5, 21000 Split; Croatia
Telephone number	00385 21 430753
E-mail address	lana.kordic@efst.hr
Personal web page	/
Year of birth	1984.
Scientist ID	295024
Research or art rank, and date of last rank appointment	Research associate, 13.12. 2013.
Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment	Assistant professor, 15.04.2014.
Area and field of election into research or art rank	Area: Social science, field: Economics
INFORMATION ON CURRENT EMPLOYMENT	
Institution where employed	University of Split, Faculty of Economics
Date of employment	Teaching assistant (from 01.04.2007.); Assistant professor (from 15.04.2014.)
Name of position (professor, researcher, associate teacher, etc.)	Assistant professor
Field of research	Croatian Economy, public sector economics, health economics, financing infrastructure projects, public-private partnership, methodology of measuring effectiveness and efficiency of public services;
Function	/
INFORMATION ON EDUCATION – Highest degree earned	
Degree	PhD
Institution	University of Split, Faculty of Economics
Place	Split
Date	11.05.2013.
INFORMATION ON ADDITIONAL TRAINING	
Year	01.10.2011.-29.02.2012. and 04.10.2010.-24.02.2011.
Place	Ljubljana, Slovenija
Institution	Faculty of Administration, University of Ljubljana
Field of training	Public sector economics
Year	2008.
Place	Split
Institution	University of Split, Faculty of Economics and Razbor d.o.o.
Field of training	Program of training for lecturers on managing pre accession programs and projects of the EU
Year	2008.
Place	Zagreb
Institution	University of Zagreb, Faculty of Economics and Business
Field of training	School of Applied Econometrics, Practical computer course
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	German - 2

(sufficient) to 5 (excellent)	
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	Slovenian - 4
COMPETENCES FOR THE COURSE	
Earlier experience as course teacher of similar courses (name title of course, study programme where it is/was offered, and level of study programme)	/
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)	• Kordić, L, Visković, J., 2017. Evolution of Croatian banking sector efficiency: DEA approach, Europe and Asia: Economic integration prospects, Book of abstracts, 16-16. • Visković, J., Kordić, L., 2017. Relationship between Country Credit Rating and Country Performance: A Data Envelopment Analysis Approach, International Days of Statistics and Economics, 14.-16. September 2017, Prague, Czech republic • Kordić, L., Šimundić, B., 2017. The efficiency of health tourism infrastructure in Croatia, International Days of Statistics and Economics, 14.-16. September 2017, Prague, Czech republic • Kordić, L., Šimundić, B., 2017. Health tourism in Croatia – questioning the efficiency of special hospitals and natural spas, 12th International Conference on Challenges of Europe: Innovative responses for resilient growth and competitiveness, 17-19. May 2017, Bol, Croatia • Mrnjavac, Ž., Bošnjak, J., Kordić, L., 2013. Studentsko prepisivanje ugrožava vrijednost diplome Ekonomskog fakulteta, Zbornik radova znanstvene konferencije Ekonomsko obrazovanje u Republici Hrvatskoj – jučer, danas, sutra, Zagreb, 263-276.
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)	<u>Participation on the projects</u>: 1. A Region based on knowledge and networking of local competences, project manager prof. Branko Grčić , financed by the Ministry of science, education and sports of the Republic of Croatia, (055-0231926-0899), 2008.-2014. 2. Concept of veteran centers residential-hospice type, financed by the Ministry of veterans of the Republic of Croatia, 2013.-2014. <u>Participation in the activities organizing and leading trainings following the programs of the Centre for lifelong education at the University of Split, Faculty of Economics:</u> 3. Feasibility study, financed by Regional agency of Split-Dalmatia County, 2014. 4. Financing NGOs and development projects for EU funds, financed by Ministry of veterans of the Republic of Croatia, 2013.-2014. 5. Pre-feasibility study - cost-benefit analysis, financed by Regional agency of Split-Dalmatia County, 2013.

	6. State aid and EU funds and pre-feasibility study - cost-benefit analysis, financed by Regional agency of Šibenik-Knin county, 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.	• Successfully completed seminar Academic Teaching Excellence – English as the Medium of Instruction, British Council, Split, 2016. • Successfully completed seminar Development and improvement of pedagogical competencies of university professors, Center for research and development of lifelong learning, Split, 2014.
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)	excellent

First and last name and title of teacher	**Lovre Krstulović-Opara, Ph. D., Full Professor**
The course he/she teaches in the proposed study programme	Product Development and Management
GENERAL INFORMATION ON COURSE TEACHER	
Address	R. Boškovića 32
Telephone number	+385/21/305777
E-mail address	Lovre.Krstulovic-Opara@fesb.hr
Personal web page	http://marjan.fesb.hr/~opara/index.html
Year of birth	1967
Scientist ID	203806
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 – permanent position 9.12.2015.
Area and field of election into research or art rank	Technical sciences, mechanical engineering, general mechanical engineering (structures)
INFORMATION ON CURRENT EMPLOYMENT	
Institution where employed	University of Split Faculty of Electr. Eng., Mech. Eng. and Naval Arch.
Date of employment	IX.2001.
Name of position (professor, researcher, associate teacher, etc.)	Full professor - permanent position
Field of research	metal structures, non-destructive testing
Function	head of Chair for structural mechanics and design
INFORMATION ON EDUCATION – Highest degree earned	
Degree	Dr.-Ing.
Institution	Leibniz Universitaet Hannover
Place	Hannover
Date	13.12.2000.
INFORMATION ON ADDITIONAL TRAINING	
Year	2015 (MT), 2014 (VT), 2013 (PT), 2012 (UT)
Place	Zagreb
Institution	Croatian society of non-destructive testing
Field of training	NDT methods: UT2, MT2, VT2, PT1
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)	Italian 4
COMPETENCES FOR THE COURSE	
Earlier experience as course teacher of similar courses (name title of course, study programme where it is/was offered, and level of study programme)	
Authorship of university/faculty	L. Krstulović-O., Ž. Domazet: Dizajn industrijskih proizvoda

textbooks in the field of the course	(skripta FESB) Ž. Domazet, L. Krstulović-O., Skripta iz osnova strojarstva (KTF)
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)	O. Andersen, M. Vesenjak, T. Fiedler, U. Jehring and L. Krstulović-Opara: "Experimental and Numerical Evaluation of the Mechanical Behavior of Strongly Anisotropic Light-Weight Metallic Fiber Structures under Static and Dynamic Compressive Loading", Materials, 9(5), 398, 2016. L. Krstulovic-Opara, M. Surjak, M. Vesenjak, Z. Tonković, J. Kodvanj, Ž. Domazet: "Comparison of infrared and 3D digital image correlation techniques applied for mechanical testing of materials", Infrared Physics & Technology, 73, 166-174, 2015. L. Krstulović-Opara, M. Vesenjak, I. Duarte, Z. Ren, Ž. Domazet: "Infrared thermography as a method for energy absorption evaluation of metal foams", Materials Today: Proceedings, 3, 1025-1030, 2016. L. Krstulovic-Opara, M. Surjak, M. Vesenjak, Z. Tonković, J. Kodvanj, Ž. Domazet: "Comparison of infrared and 3D digital image correlation techniques applied for mechanical testing of materials", Infrared Physics & Technology, 73, 166-174, 2015. I. Duarte, M. Vesenjak, L. Krstulovic-Opara, Z. Ren :"Static and dynamic axial crush performance of in-situ foam-filled tubes", Composite structures, **124**, 128–139, 2015. L. Krstulovic-Opara: "Application of thermography in analysis of fatigue strength of materials and structures", HDKBR info, 10, 3-11, 2013.
The name of the programme and the volume in which the main teacher passed exams in/acquired the methodological-psychological-didactic-pedagogical group of competences?-pedagoške kompetencije?	„Training for administrative and educational personnel“ part of the EU project ME4CataLOgue (Mechanical Engineering for Catalogue)
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)	Results are confidential matter and kept by employer (University of Split, FESB)

First and last name and title of teacher	**Branimir Lela, Ph. D., Assistant Professor**
The course he/she teaches in the proposed study programme	Tools and fixtures
GENERAL INFORMATION ON COURSE TEACHER	
Address	Ruđera Boškovića 32, Split
Telephone number	021/305909
E-mail address	blela@fesb.hr
Personal web page	
Year of birth	1976
Scientist ID	250123
Research or art rank, and date of last rank appointment	Scientific associate, 10/12/2010
Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment	assistant professor, 18/04/2012
Area and field of election into research or art rank	Technical Sciences, Field Mechanical Engineering
INFORMATION ON CURRENT EMPLOYMENT	
Institution where employed	Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture
Date of employment	01/10/2001
Name of position (professor, researcher, associate teacher, etc.)	Assistant professor
Field of research	Engineering materials; Metal heat treatment; Forming by deformation; Numerical modelling of production processes; Tools and fixtures
Function	Vice Dean for Education
INFORMATION ON EDUCATION – Highest degree earned	
Degree	PhD
Institution	Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture
Place	Split
Date	16/07/2010
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)	
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	**Undergraduate study:** 1. Technology 2 (130) 2. Technology 2 (150)

where it is/was offered, and level of study programme)	3. Fundamentals of technologies (140) **Professional study:** 1. Metal forming by deformation (530) 2. Technology of metal processing (540) **Graduate study:** 1. Tools and fixtures (263,261,271,272) **Postgraduate study**: 1. Processing by deformation (330)
Authorship of university/faculty textbooks in the field of the course	- Manual for laboratory exercise in processing by deformation - Manual for laboratory exercise in heat treatment
Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)	1. Jozić, Sonja; Lela, Branimir; Bajić, Dražen. **A New Mathematical Model for Flank Wear Prediction Using Functional Data Analysis Methodology**. *Advances in Materials Science and Engineering*. **2014** (2014) ; 1-8 2. Lela, Branimir; Musa, Ante; Zovko, Oliver. **Model-based controlling of extrusion process**. *International journal of advanced manufacturing technology*. **74** (2014) , 9-12; 1267-1273 3. Krstić Vukelja, Elizabeta; Duplančić, Igor; Lela, Branimir. **Continuous roll casting of aluminium alloys– casting parameters analysis**. *Metalurgija*. **49** (2010) , 2; 115-118 4. Cvitanić, Vedrana; Ivandić, Daniel; Lela, Branimir. **Comparison of orthotropic constitutive models in predicting square cup deep drawing process of AA2090-T3 sheet** . *Proceedings of 4th International Conference Mechanical Technologies and Structural Materials 2014* / Živković, Dražen (ur.). Split : Croatian society for mechanical technologies, 2014. 61-70 5. Lela, Branimir; Živković, Dražen; Šapina, Ivona. **ANNEALING INFLUENCE ON GRAIN SIZE AND MECHANICAL PROPERTIES IN LOW CARBON STEELS**. *Mechanical technologies and structural materials conference proceedings* / Živković, Dražen (ur.). Split : Croatian society for mechanical technologies, 2013. 127-132
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. Improving the properties and methods of processing aluminium alloys Project manager: prof. dr. sc. Igor Duplančić, Time period: 2007.-2014. Financing: MZOŠ 2. Parameters optimization and prediction of results of metal heat treatment Project manager: prof. dr. sc. Božo Smoljan, Time period: 2014.- Financing: HRZZ
The name of the programme and	Training for teachers and administrative staff within EU project

the volume in which the main teacher passed exams in/acquired the methodological-psychological-didactic-pedagogical group of competences?	ME4CataLOgue
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)	4.5/5

First and last name and title of teacher	**Gojko Magazinović, Ph. D., Full Professor**
The course he/she teaches in the proposed study programme	Computer Aided Design 2
GENERAL INFORMATION ON COURSE TEACHER	
Address	Trg Mihovila Pavlinovića 6, 21000 Split, HR
Telephone number	+385 21 305 966
E-mail address	gmag@fesb.hr
Personal web page	www.fesb.hr/~gmag
Year of birth	1956
Scientist ID	139574
Research or art rank, and date of last rank appointment	Scientific Adviser, 1/12/2010
Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment	Full Professor, 27/9/2012
Area and field of election into research or art rank	Technical Sciences, Field Mechanical Engineering
INFORMATION ON CURRENT EMPLOYMENT	
Institution where employed	Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture
Date of employment	1/9/1994
Name of position (professor, researcher, associate teacher, etc.)	Professor
Field of research	Engineering applications of computer
Function	Teacher
INFORMATION ON EDUCATION – Highest degree earned	
Degree	PhD
Institution	Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture
Place	Split
Date	14/3/2002
INFORMATION ON ADDITIONAL TRAINING	
Year	2004, 2005
Place	Split
Institution	Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture
Field of training	Computer aided design (Pro/Engineer, Catia, Unigraphics; three separate courses)
MOTHER TONGUE AND FOREIGN LANGUAGES	
Mother tongue	Croatian
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	English (3)
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	
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	Computer Aided Design, Undergraduate study programme

study programme)	
Authorship of university/faculty textbooks in the field of the course	1. Magazinović, Gojko: Primjena elektroničkih računala – Podloge za laboratorijske vježbe - Programski jezik Fortran 90, Skripta, FESB Split, ISBN 953-6114-60-7, Split, 2003. 2. Magazinović, Gojko: Primjena elektroničkih računala – Podloge za laboratorijske vježbe - Programski jezik C, Skripta, FESB Split, ISBN 953-6114-59-3, Split, 2003.
Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)	1. Pivac, Ivan; Magazinović, Gojko. Numerical analysis of tank heating coil heat transfer process, in: Towards Green Marine Technology and Transport // Guedes Soares, Carlos; Dejhalla, Roko; Pavletić, Duško (Eds). London: Taylor & Francis Group, 2015. 603-608. 2. Bezmalinović, Dario; Magazinović, Gojko; Barbir, Frano. Analysis of Fuel Cell Stacks Degradation by Polarization Change Curves // Proceedings, 2014 IEEE Vehicle Power and Propulsion Conference VPPC2014 / Paulo J. G. Pereirinha (Ed.). IEEE, 2014. 139-141. 3. Magazinović, Gojko. Least Inertia Approach to Low-speed Marine Diesel Propulsion Shafting Optimum Design, Brodogradnja 65(2014)3, 75-87. 4. Magazinović, Gojko. Transient Torsional Vibration Analysis of Marine Propulsion Plants, // Proceedings, Sorta 2014 / Dejhalla, Roko (Ed.). Rijeka: Tehnički fakultet, Sveučilište u Rijeci, 2014. 505-512 5. Magazinović, Gojko. Castor - A Propulsion Shaftline Torsional Vibration Assessment Tool, Paper No. 76, // Proceedings Sorta 2012 / Žiha, Kalman, et al. (Eds.). Zagreb: Faculty of Mechanical Engineering and Naval Architecture, Zagreb, and Brodarski Institute, Zagreb, 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)	1. HRZZ Istraživački projekt: Upravljanje vodom i toplinom i trajnost membranskih gorivnih članaka, 2015-2018. 2. FP7 Istraživački projekt: SAPPHIRE, 2013-2016.
The name of the programme and the volume in which the main teacher passed exams in/acquired the methodological-psychological-didactic-pedagogical group of competences?-pedagoške kompetencije?	IPA IV projekt "ME4CataLOgue - Hrvatski katalog znanja, vještina i kompetencija za studije strojarstva temeljen na ishodima učenja (za preddiplomski, diplomski i doktorski studij)", Trening implementacije ishoda učenja u razvoj studijskih programa i kurikuluma, Split, 2014.
PRIZES AND AWARDS, STUDENT EVALUATION	
Prizes and awards for teaching and scholarly/artistic work	Award for the significant results achieved in scientific research, FESB Split, 1982.
Results of student evaluation taken in the last five years for the course that is comparable to the course described in the form (evaluation organizer, average grade, note on grading scale and course evaluated)	4,0/5

First and last name and title of teacher	**Jadranka Marasović, Ph. D., Full Professor**
The course he/she teaches in the proposed study programme	Automation
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:** Mjerenje i vođenje procesa (Measurements and Process Control),

	Automatizacija industrijskih procesa (Industrial Process Control) **Graduate studies:** Automatsko reguliranje procesa (Automatic Control), Identifikacija sustava (System Identification), Praktikum iz vođenja procesa (Process Control Laboratory Exercises) Metode optimizacije (Optimization Methods), Operacijska istraživanja (Operations Research) Automatizacija (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?-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	**Nedjeljko Mišina, Ph. D., Full Professor**
The course he/she teaches in the proposed study programme	Economic Treatments of Materials
GENERAL INFORMATION ON COURSE TEACHER	
Address	Ruđera Boškovića 32, SPLIT
Telephone number	021/305911
E-mail address	nmisina@fesb.hr
Personal web page	----
Year of birth	1950.
Scientist ID	71172
Research or art rank, and date of last rank appointment	Scientific Adviser, 31/ 05/ 2006.
Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment	Senior Full Professor, 25/1/2013.
Area and field of election into research or art rank	Technical Sciences, Field Mechanical Engineering
INFORMATION ON CURRENT EMPLOYMENT	
Institution where employed	Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture
Date of employment	1/10/1977
Name of position (professor, researcher, associate teacher, etc.)	Professor
Field of research	Mechanical Engineering
Function	Head of Chair of Materials and Tribology
INFORMATION ON EDUCATION – Highest degree earned	
Degree	PhD
Institution	Faculty of Mechanical Engineering and Naval Architecture
Place	Zagreb
Date	24/6/1992.
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 (4)
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	Germany (2)
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	
COMPETENCES FOR THE 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)	Materials (530, 540), Materials 1 (150), Materials 2 (150, 130), Technology 1 (150), Welding and similar treatments (530, 540)
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. Ž. Bilić, N. Mišina, L. Kuščer, J. Diaci, I. Polajnar: ¨Influence of welding conditions on resistance flash welds¨, International Journal of Microstructure and Materials Properties, Vol. 8, No. 6, 2013., 425-435. 2. N. Mišina, I. Polajnar, Ž. Bilić: ¨Production and weldability of microalloyed steels¨, 6. International scientific-professional conference, Slavonski Brod, 2011., 15-26.
Professional and scholarly articles published in the last five years in subjects of teaching methodology and teaching quality (5 works at most)	1. I. Polajnar, N. Mišina: ¨Automation and/or robotization of welding processes¨, CIM 2011., Biograd, 195-202. 2. I. Polajnar, N. Mišina: ¨The latest achievement of personal protection for welders¨, 3. International Professional and Safety and Health, Zadar, 2010., 53-61
Professional, science and artistic projects in the field of the course carried out in the last five years (5 at most)	1. Ž. Bilić, I. Samardžić, N. Mišina: ¨Opasnosti i mjere zaštite kod postupaka zavarivanja¨, Dan varilne tehnike, Novo Mesto, 2014., 185-189
The name of the programme and the volume in which the main teacher passed exams in/acquired the methodological-psychological-didactic-pedagogical group of competences?-pedagoške kompetencije?	
PRIZES AND AWARDS, STUDENT EVALUATION	
Prizes and awards for teaching and scholarly/artistic work	
Results of student evaluation taken in the last five years for the course that is comparable to the course described in the form (evaluation organizer, average grade, note on grading scale and course evaluated)	4,3/6

First and last name and title of teacher	**Željko Mrnjavac, Ph. D., Full Professor**
The course he/she teaches in the proposed study programme	Croatian Economy
GENERAL INFORMATION ON COURSE TEACHER	
Address	, Cvita Fiskovića 5, Split
Telephone number	021 430672
E-mail address	mrnjavac@efst.hr
Personal web page	
Year of birth	1963
Scientist ID	198715

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 with tenure 03.07.2007.
Area and field of election into research or art rank	Economics
INFORMATION ON CURRENT EMPLOYMENT	
Institution where employed	University of Split, Faculty of Economics
Date of employment	15.12.1992.
Name of position (professor, researcher, associate teacher, etc.)	Full professor with tenure
Field of research	
Function	
INFORMATION ON EDUCATION – Highest degree earned	
Degree	PhD
Institution	University of Split, Faculty of Economics
Place	Split
Date	1996
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 4
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	German 4
COMPETENCES FOR THE COURSE	
Earlier experience as course teacher of similar courses (name title of course, study programme where it is/was offered, and level of study programme)	yes
Authorship of university/faculty textbooks in the field of the course	Vladimir ČAVRAK (ur): Gospodarstvo Hrvatske, Politička kultura, Zagreb 2011
Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)	• Mrnjavac, Željko; Bečić, Marija. (2014): **Utjecaj socio-ekonomskih obilježja na vjerojatnost pojave preobrazovanosti u Republici Hrvatskoj**, Revija za socijalnu politiku 21.3 309-325. • Bejaković, Predrag; Mrnjavac, Željko (2014) **Skill Mismatches and Anticipation of the Future Labour Market Need: Case of Croatia**, Zagreb International Review of Economics & Business, Vol. 17, No. 1, pp. 47-68 • Mrnjavac, Željko (2013) **Aktivna politika tržišta rada: čačkalicom protiv zmaja (Active labour market policy: Fighting a dragon with a toothpick)**, 7. Zagrebački ekonomski forum, Friedrich-Ebert-Stiftung, pp. 39-53

	• Mrnjavac, Željko; Blažević, Sanja (2013): **Is minimum wage a good policy for poor workers in Croatia?**, Proceedings: Challenges of Europe: The Quest for New Competitiveness, Split, pp. 121-143 • Mrnjavac, Željko; Tokić, Amalija (2012) **Očekivanja studenata Ekonomskog fakulteta o ishodima ulaska na tržište rada (Expectations of students of the Faculty of Economics about their labour market outcomes)** in Čavrak, Vladimir ; Gelo, Tomislav (ed): Ekonomsko obrazovanje u Republici Hrvatskoj–jučer, danas, sutra, Ekonomski fakultet Sveučilišta u Zagrebu, Zagreb, pp. 439-460
Professional and scholarly articles published in the last five years in subjects of teaching methodology and teaching quality (5 works at most)	
Professional, science and artistic projects in the field of the course carried out in the last five years (5 at most)	
The name of the programme and the volume in which the main teacher passed exams in/acquired the methodological-psychological-didactic-pedagogical group of competences?-pedagoške kompetencije?	
PRIZES AND AWARDS, STUDENT EVALUATION	
Prizes and awards for teaching and scholarly/artistic work	
Results of student evaluation taken in the last five years for the course that is comparable to the course described in the form (evaluation organizer, average grade, note on grading scale and course evaluated)	

First and last name and title of teacher	**Sandro Nižetić, Ph. D., Associate Professor**
The course he/she teaches in the proposed study programme	Rational use of energy
GENERAL INFORMATION ON COURSE TEACHER	
Address	Slovenićeva 5, 21000, Split
Telephone number	+385914305954
E-mail address	snizetic@fesb.hr
Personal web page	
Year of birth	03.06.1980.
Scientist ID	272991
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	izv.prof., December 18, 2013.
Area and field of election into research or art rank	Technical sciences, Thermodynamics.
INFORMATION ON CURRENT EMPLOYMENT	
Institution where employed	Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture
Date of employment	01/03/2003.
Name of position (professor, researcher, associate teacher, etc.)	Associate Professor
Field of research	Thermodynamics, Energy Efficiency, Energy Conversion, Renewable energy.
Function	Head of Laboratory for Thermodynamics and Energy Efficiency
INFORMATION ON EDUCATION – Highest degree earned	
Degree	PhD
Institution	Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture
Place	Split
Date	12/02/2009
INFORMATION ON ADDITIONAL TRAINING	
Year	2016.
Place	USA
Institution	Florida solar energy research centre
Field of training	Renewable energy, energy efficiency in buildings.
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)	Thermodynamics 1 and 2 (undergraduate study programme), Heat and mass transfer (graduate study programme), rational use of energy (graduate study programme).

Authorship of university/faculty textbooks in the field of the course	Rational use of energy, online lectures (2010), FESB.
Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)	1) Nižetić, S.,Papadopulos, A.M.,Tina, G.M., Rosa-Clot, M. Hybrid energy scenarios for residential applications based on the heat pump split air-conditioning units for operation in the Mediterranean climate conditions, Energy and Buildings 140,110-120,(2017) 2) S. Nižetić, F. Grubišić- Čabo, I. Marinic-Kragić, A.M. Papadopoulos. Experimental and numerical investigation of a backside convective cooling mechanism on photovoltaic panels, Energy 111, 211-225, (2016). 3) Grubišić-Čabo, F., Nižetić, S., Tina, G.M. Photovoltaic panels: A review of the cooling techniques, Transactions of FAMENA, SI, 63-74, (2016). 4) Grigoropoulos, E., Anastaselos, D., Nižetić, S., Papadopoulos, A.M. Effective ventilation strategies for net zero-energy buildings in Mediterranean climates, International Journal of Ventilation, Pages 1-17, (under press, DOI: 10.1080/14733315.2016.1203607), (2016). 5) Nižetić, S., Čoko, D., Yadav, A., Grubišić-Čabo, F. Water spray cooling technique applied on a photovoltaic panel: The performance response, Energy Conversion and Management 108,287-296, (2016), 6) Lela, B., Barišić, M., Nižetić, S. Cardboard/sawdust briquettes as biomass fuel: Physical-Mechanical and thermal characteristics, Waste Management 47(B), 236-245, (2016), 7) Nižetić, S., Tolj, I., Papadopulos, A.M. Hybrid energy fuel cell based system for household applications in a Mediterranean climate, Energy Conversion and Management 105(15),1037-1045 (2015), 8) Nižetić, S., Duić, N., Papadopulos, A.M., Tina, G.M., Grubišić-Čabo, F. Energy efficiency evaluation of a hybrid energy system for building applications in a Mediterranean climate and its feasibility aspect, Energy 90, 1171-1179, (2015), 9) S. Nižetić, F. Grubišić-Čabo, M. Bugarin. Experimental setup for the analysis of vortices. Journal of Applied Fluid Mechanics 8(1),143-149, (2015) 10) S. Nižetić, R. Gizdic, A. Yadav, M. Bugarin. Integrated split heat pump system for building applications, Applied Mechanics and Materials 705, 263-267, (2015) 11) S. Nizetic, D. Coko, I. Marasovic, Experimental study on a hybrid energy system with small-and medium-scale applications for mild climates, Energy 75, 379-389, (2014) 12) S. Nizetic. Analytical approach for estimating the pressure drop potential in convective vortex heat engines. Transactions of the Canadian Society for Mechanical Engineering, 38(1), 81-91, (2014).
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	-2008. – 2013.- UNDP (United Nations Development Programme), "Removing Barriers to Energy Efficiency in

carried out in the last five years (5 at most)	Croatia'', Project Coordinator for the Dalmatian region, -2007. – 2013.- Research project (023-0231751-3011), "New aspect of solar energy utilization in solar chimney power plants, Head of the scientific project, Ministry of Science, Education and Sports. -2003. - 2006., Research project (0023013), "Significant reduction of chimney height in solar chimney power plants'', Researcher, Ministry of Science, Education and Sports. -2015.-to date-Research of the ice based floating structures, cooperation with DIV company.
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)	4,9/5.0

First and last name and title of teacher	**Tonči Piršić, Ph. D., Associate Professor**
The course he/she teaches in the proposed study programme	Transport in industry
GENERAL INFORMATION ON COURSE TEACHER	
Address	Stepinčeva 2, 21000 Split
Telephone number	021/535517
E-mail address	tpirsic@fesb.hr
Personal web page	www.fesb.hr/kk
Year of birth	1959.
Scientist ID	134894
Research or art rank, and date of last rank appointment	Higher scientific colaborator 15. 06. 2016.
Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment	Associate proffesor 15. 06. 2016.
Area and field of election into research or art rank	Technical science, general mechanical engineering, construction
INFORMATION ON CURRENT EMPLOYMENT	
Institution where employed	Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture
Date of employment	01. 10. 1987.
Name of position (professor, researcher, associate teacher, etc.)	Proffesor
Field of research	Machine elements, fatigue of materials, transport in industry
Function	
INFORMATION ON EDUCATION – Highest degree earned	
Degree	PhD
Institution	Faculty ofMechanical Engineering and Naval Architecture
Place	Zagreb
Date	15.06. 1999.
INFORMATION ON ADDITIONAL TRAINING	
Year	2001
Place	Bologna, Italy
Institution	University of Bologna
Field of training	Fatogu of materials
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)	
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)	Professor of Transport in industry Graduate study programme,
Authorship of university/faculty	T. Piršić: Tehničko crtanje, FESB Split, 2010.

textbooks in the field of the course	T. Piršić: AutoCAD u Strojarstvu, FESB Split, 2008. T. Piršić: Transport u industriji, FESB Split, 2005.
Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)	T. Piršić: "Experimentally Based Method for Fatigue Life Prediction of Aluminium Welded Joints", Fatigue 99, Proceedings of the 7. International Fatigue Congress, Beijing, P.R. China, Editors X. R Wu and Z. G. Wang, pp. 1309 -1312, Volume 2/4, Higher Education Press, Beijing, P.R. China, Engineering Advisory Services Ltd, UK, 1999. ISBN 1901537080 (Rad objavljen u knjizi) Ž. Domazet, Ž. Lozina, T. Piršić: "Fatigue Damage and Repair of 250 kN Crane in Shipyard", Proceedings of the 10th International Conference on Fracture, Hawai, USA, 2001. Ž. Domazet, T. Piršić: "Fatigue Failures in industry – Case Studies", Proceedings of the 7th International Design Conference, Vol. 2., pp. 1153-1158, ISBN 953-6313-47-9, Dubrovnik, 2002. Ž. Domazet, T. Piršić, M. Stupalo: "Fatigue Damages and Repair of a Cement Mill Gear Wheel", Proceedings of 4th International Congress of Croatian Society of Mechanics, pp. 145-151, ISBN 953-96243-4-7, Bizovac, Croatia, 2003.
Professional and scholarly articles published in the last five years in subjects of teaching methodology and teaching quality (5 works at most)	
Professional, science and artistic projects in the field of the course carried out in the last five years (5 at most)	
The name of the programme and the volume in which the main teacher passed exams in/acquired the methodological-psychological-didactic-pedagogical group of competences?-pedagoške kompetencije?	
PRIZES AND AWARDS, STUDENT EVALUATION	
Prizes and awards for teaching and scholarly/artistic work	
Results of student evaluation taken in the last five years for the course that is comparable to the course described in the form (evaluation organizer, average grade, note on grading scale and course evaluated)	

First and last name and title of teacher	**Gojmir Radica, Ph. D., Full Professor**
The course he/she teaches in the proposed study program	Thermal Machines
GENERAL INFORMATION ON COURSE TEACHER	
Address	Tolstojeva 43, 21000 Split
Telephone number	021 305955
E-mail address	gojmir.radica@fesb.hr
Personal web page	https://nastava.fesb.unist.hr/nastava/nastavnici/detalji/goradica
Year of birth	1962
Scientist ID	245370
Research or art rank, and date of last rank appointment	15.9.2010. scientific adviser
Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment	20.03.2013. Full professor
Area and field of election into research or art rank	Technical science, mechanical engineering, marine engineering
INFORMATION ON CURRENT EMPLOYMENT	
Institution where employed	Faculty of electrical engineering mechanical engineering and naval architecture
Date of employment	1.10.2011.
Name of position (professor, researcher, associate teacher, etc.)	Professor
Field of research	Thermodynamic machines, marine engineering
Function	Professor
INFORMATION ON EDUCATION – Highest degree earned	
Degree	Doctor of Science in Mechanical Engineering
Institution	Postgraduate Studies, Faculty of Mechanical Engineering and Naval Architecture - University of Zagreb
Place	Zagreb
Date	21.06.2004.
INFORMATION ON ADDITIONAL TRAINING	
Year	1992
Place	Split, Croatia
Institution	Maritime faculty University of Split, Croatia
Field of training	Marine engineer
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- 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	Professional studies: – Thermal and hydraulic machines (430) – Marine propulsion (440)

study programme)	Undergraduate studies: – Thermal machines (130) – Marine engineering (140) – Marine machineries and devices (140) – Propulsion systems of small ships (140)) Graduate studies: – Power plant (260) – Thermal machines (270) – Ship propulsion systems (260) Doctoral study: - Expert systems for diagnostic
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)	– Lalić, B., Radica, G., Račić, N.: Analysis of exhaust gas emission in the marine two stroke engine, Brodogradnja 67, 2016, ISSN 0007-215X – Jurić T., Radica G., Jelić M.: Experimental Method for Marine Engine's Emissions Analysis, Naše more, 2016, Dubrovnik; DOI 10.17818/NM/2016/1.4;UDK 629.5:621.43; – Grljušić, Mirko; Medica, Vladimir; Radica, Gojmir. Calculation of Efficiencies of a Ship Power Plant Operating with Waste Heat Recovery through Combined Heat and Power Production. // Energies. 8 (2015) , 5; 4273-4299 (članak, znanstveni) – Landeka, P., Radica, G..: Efficiency Increase in Ships Primal Energy System, THERMAL SCIENCE, Year 2016, Vol. 20, No. 2, pp. 1-8 – N. Račić, G. Radica, F. Lušić: Simulation of the marine engine performance with the purpose of predicting parameters, 6th. International Maritime Science Conference,IMSCpage 437-444; ISSN 1847-1498, 2014. – Hour by hour simulation of solar hydrogen energy system in conjunction with renewable energy sources; J. Simunovic, D. Bagaric, N. Goles, D. Bezmalinovic, I. Tolj, G. Radica, F. Barbir; 5th EUROPEAN PEFC & H2 FORUM June, 2015. Luzern Switzerland
Professional and scholarly articles published in the last five years in subjects of teaching methodology and teaching quality (5 works at most)	– Barle, Jani; Franulović, Marina; Jurčević Lulić, Tanja; Kladarić, Ivica; Markučič, Damir; Radica, Gojmir. Izrada kataloga znanja, vještina i kompetencija za studije strojarstva u Republici Hrvatskoj // Zbornik radova međunarodne stručne konferencije ME4CataLOgue / Kozak, D., Barle, J., Markučič, D., Pavletić, D., Matičević, G, Vranešević M. N., Rosandić, Ž, Damjanović D. (ur.). Slavonski Brod : Strojarski fakultet u Slavonskom Brodu, 2014. 21-30 (plenarno predavanje,međunarodna recenzija,objavljeni rad,stručni).
Professional, science and artistic projects in the field of the course carried out in the last five years (5 at most)	– Repowering motor boat 2012-13
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	– Implementacije ishoda učenja u razvoj studijskih programa i kurikuluma; Povezivanje ishoda učenja i metoda poučavanja-Prof. dr. sc. Izabela Sorić, Odjel za psihologiju,Sveučilište u Zadru, i Doc. dr. sc. Slavica Šimić Šašić,Odjel izobrazbu učitelja i odgojitelja,Sveučilište u Zadru, ukupno 24 sata; u sklopu IPA IV projekt: "ME4CataLOgue - Hrvatski katalog znanja, vještina i

	kompetencija za studije strojarstva temeljen na ishodima učenja (za preddiplomski, diplomski i doktorski studij)", aktivni učesnik projekta od 9.2013-2.2015.
PRIZES AND AWARDS, STUDENT EVALUATION	
Prizes and awards for teaching and scholarly/artistic work	Gold medal for patent on 8th Innovation fair INVENTUM 2014.
Results of student evaluation taken in the last five years for the course that is comparable to the course described in the form (evaluation organizer, average grade, note on grading scale and course evaluated)	4,8/5

First and last name and title of teacher	**Marija Šiško Kuliš, Ph.D., Associate Professor**
The course he/she teaches in the proposed study programme	Assessment of technology projects
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	• Entrepreneurship, Professional Study of Mechanical Engineering, Electrical Engineering, University of Split, Department of Professional Studies, • Entrepreneurship in the media, professional study, TV

study programme)	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	**Ivica Veža, Ph. D., Full Professor**
The course he/she teaches in the proposed study programme	Plant Layout Management of PLM Projects
GENERAL INFORMATION ON COURSE TEACHER	
Address	Odeska 13, 21000 Split, HR
Telephone number	+385 21 305933
E-mail address	iveza@fesb.hr
Personal web page	
Year of birth	1951.
Scientist ID	095643
Research or art rank, and date of last rank appointment	Scientific Adviser - Mechanical Engineering, 08.03.2001. Scientific Adviser – Fundamental Technical Science 05.07.2006.
Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment	Senior Full Professor, 23.01.1998.
Area and field of election into research or art rank	Technical Sciences, Field Industrial engineering
INFORMATION ON CURRENT EMPLOYMENT	
Institution where employed	Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture
Date of employment	1/1/1981
Name of position (professor, researcher, associate teacher, etc.)	Professor
Field of research	Plant Layout, Organization, Production Engineering
Function	Head of Chair of Inudstrial Engineering
INFORMATION ON EDUCATION – Highest degree earned	
Degree	PhD
Institution	Faculty of Mechanical Engineering and Naval Architecture
Place	Zagreb
Date	9/11/2001
INFORMATION ON ADDITIONAL TRAINING	
Year	1983/84
Place	Stuttgart, Germany
Institution	University of Stuttgart, Fraunhofer – Institut fuer Produktiontechnik und Automatisierung
Field of training	Plant Layout, Simulation
INFORMATION ON ADDITIONAL TRAINING	
Year	1991
Place	Berlin, Germany
Institution	Technical University of Berlin, Fraunhofer IPK
Field of training	Design of Assembly 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 (4)
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	Germany (4)
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)	Economics and Production Organisation, Undergraduate study programme,
Authorship of university/faculty textbooks in the field of the course	Veža, Ivica, Bilić, Boženko, Bajić, Dražen, "Projektiranje proizvodnih sustava", Fakultet elektrotehnike, strojarstva i brodogradnje, Split, 2001. Veža, Ivica: Bilić, Boženko; Gjeldum, Nikola; Mladineo, Marko: "Upravljanje projektima", Fakultet elektrotehnike, strojarstva i brodogradnje, Split, 2011.
Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)	1. Perić, Tunjo; Babić, Zoran; Veža, Ivica: Vendor selection and supply quantities determination in a bakery by AHP and fuzzy multi-criteria programming. International journal of computer integrated manufacturing. 26 (2013) , 9; 816-829 2. Veža, Ivica; Mladineo, Marko: SUSTAINABILITY THROUGH PRODUCTION NETWORKS. Management and Production Engineering Review. 4 (2013), 4; 33-39 3. Gjeldum, Nikola; Bilić, Boženko; Veža, Ivica. Investigation and modelling of process parameters and workpiece dimensions influence on material removal rate in CWEDT process. International journal of computer integrated manufacturing. 28 (2015) , 7; 715-728 4. Takakuwa, Soemon; Veža, Ivica: Technology Transfer and World Competitiveness. Procedia Engineering. 69 (2014); 121-127 5. Banduka, Nikola; Veža, Ivica; Bilić, Boženko: An integrated lean approach to Process Failure Mode and Effect Analysis (PFMEA): A case study from automotive industry. Advances in Production Engineering & Management. 11 (2016) , 4; 355-365
Professional and scholarly articles published in the last five years in subjects of teaching methodology and teaching quality (5 works at most)	1. Gečevska, Valentina; Čuš, Franci; Chiabert, Paolo; Veža, Ivica: LINKING LEAN PRODUCTION WITH PRODUCT LIFECYCLE MANAGEMENT FOR SUSTAINABLE BUSINESS ENVIRONMENT, DEVELOPMENT OF INTELLIGENT AND INNOVATIVE TOOLS FOR PRODUCTION PROCESS ENGINEERING AND SUSTAINABLE MANAGEMENT, Čuš, F.; Gečevska, V. (Ed.). Maribor, Slovenija: Faculty of Mechanical engineering, Maribor, 2013. 19-39. 2. Čelar, Stipe; Turić, Mili; Dragičević, Srdjana; Veža, Ivica. Digital Learning Factory at FESB – University of Split , ZBORNIK RADOVA YU INFO 2016, 2016. 001-006 3. Veža, Ivica; Gjeldum, Nikola; Mladineo, Marko: Logistics Personal Excellence by Continuous Self-Assessment (LOPEC): Pilot Implementation - Case Studies. Conference Proceedings - MTSM 2014, Split, 2014. 39-46 4. Stojkić, Željko; Veža, Ivica; Bošnjak, Igor. CONCEPT OF INFORMATION SYSTEM IMPLEMENTATION (CRM AND ERP) WITHIN INDUSTRY 4.0, Proceedings of the 26th DAAAM International Symposium, Vienna, DAAAM International, 2016. 912-919
Professional, science and artistic projects in the field of the course carried out in the last five years (5 at most)	1. 2008 – 2013 Project TEMPUS-2008-IT-JPCR 144 959, Master Study Program in Product Lifecycle Management with Sustainable Production 2. 2011-2014 LEONARDO DA VINCI Project "LOPEC - Logistics personnel excellence by continuous self-

	assessment", FESB Split, University of Reutlingen 3. 2013-2016 Network of Innovative Learning Factories NIL, "System - Learning Factory", FESB, Split, University of Reutlingen 4. 2013-2016 Know-how Exchange on the Consequences and Challenges of the Integration of Key Enabling Technologies in European Manufacturing for the Danube Region, Fraunhofer Institute for Systems and Innovation Research ISI – Karlsruhe 5. 2014-2018 Innovative Smart Enterprise, INSENT, Croatian Science Foundation, Zagreb
The name of the programme and the volume in which the main teacher passed exams in/acquired the methodological-psychological-didactic-pedagogical group of competences?-pedagoške kompetencije?	
PRIZES AND AWARDS, STUDENT EVALUATION	
Prizes and awards for teaching and scholarly/artistic work	
Results of student evaluation taken in the last five years for the course that is comparable to the course described in the form (evaluation organizer, average grade, note on grading scale and course evaluated)	4,8/5

First and last name and title of teacher	**Damir Vučina, Ph. D., Full Professor**
The course he/she teaches in the proposed study programme	Optimization methods
GENERAL INFORMATION ON COURSE TEACHER	
Address	FESB, R. Boškovića 32, 21000 Split
Telephone number	021 305 969
E-mail address	vucina@fesb.hr
Personal web page	
Year of birth	1962
Scientist ID	129716
Research or art rank, and date of last rank appointment	Scientific Adviser, 2005
Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment	Senior Full Professor, 2005
Area and field of election into research or art rank	Technical Sciences, Fundamental Technical Sciences
INFORMATION ON CURRENT EMPLOYMENT	
Institution where employed	Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture
Date of employment	1985
Name of position (professor, researcher, associate teacher, etc.)	Professor
Field of research	Numerical methods in engineering and optimization
Function	Head of group for modeling and computer-aided analysis
INFORMATION ON EDUCATION – Highest degree earned	
Degree	PhD
Institution	Fakultet strojarstva i brodogradnje
Place	Zagreb
Date	1993
INFORMATION ON ADDITIONAL TRAINING	
Year	Fulbright grant, Columbia University New York Several courses at CISM Italy
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 (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)	Computer.aided analysis Optimization methods Programming Graduate courses

Authorship of university/faculty textbooks in the field of the course	D. Vučina, 'Metode inženjerske numeričke optimizacije', Sveučilište u Splitu, FESB 2005 Damir Vučina, 'Primjena računala u inženjerskoj analizi', FESB, 2007
Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)	**p1.** Ćurković, M.; Vučina, D. 3D Shape acquisition and integral compact representation using optical scanning and enhanced shape parameterization. Advanced engineering informatics. 28 (2014) , 2; 111-126, IF 2.086. **p2.** Vučina, D.; Ćurković, M.; Novković, T. CLASSIFICATION OF 3D SHAPE DEVIATION USING FEATURE RECOGNITION OPERATING ON PARAMETERIZATION CONTROL POINTS. // Computers in industry. 65 (2014) , 6; 1018-1031. IF 1.457. **p3.** Milas, Zoran; Vučina, Damir; Marinić-Kragić, Ivo. MULTI-REGIME SHAPE OPTIMIZATION OF FAN VANES FOR ENERGY CONVERSION EFFICIENCY USING CFD, 3D OPTICAL SCANNING AND PARAMETERIZATION. // Engineering Applications of Computational Fluid Mechanics. 8 (2014), 3; 407-421. IF 0.921. **p6.** Vučina, D.; Lozina, Ž.; Pehnec, I. Ad-Hoc Cluster and Workflow for Parallel Implementation of Initial-Stage Evolutionary Optimum Design. Structural and multidisciplinary optimization. 45 (2012) , 2; 197-222. IF 1.488. **p5.** Vučina, D.; Lozina, Ž.; Pehnec, I. Computational procedure for optimum shape design based on chained Bezier surfaces parameterization. Engineering applications of artificial intelligence. 25 (2012) , 3; 648-667. IF 1.665.
Professional and scholarly articles published in the last five years in subjects of teaching methodology and teaching quality (5 works at most)	s.a.
Professional, science and artistic projects in the field of the course carried out in the last five years (5 at most)	s.a..
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?	continuously
PRIZES AND AWARDS, STUDENT EVALUATION	
Prizes and awards for teaching and scholarly/artistic work	1. Columbia University, New York, USA, 1986- 1987, dobitnik US Fulbright stipendije 2. Sveučilište u Splitu, za tehničke znanosti, 2014
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)	excellent

3.4. Optimal number of students

The admission quote for the first year of studies is 40.

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</td></tr>
<tr><td colspan="2">• 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 Mechanical Engineering, Naval Architecture and Industrial Engineering 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</td></tr>
</table>

	procedure of the Department, since the Committees for study programmes are bodies of the Faculty Council and are accountable to the Faculty Council.
Evaluation of availability of resources (spatial, human, IT) in the process of learning and instruction	• 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)	Student training is not a mandatory part of the programme. Some of the students complete elective-based training abroad
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