UNIVERSITY OF SPLIT

FACULTY OF ELECTRICAL ENGINEERING, MECHANICAL ENGINEERING AND NAVAL ARCHITECTURE

DETAILED PROPOSAL OF THE STUDY PROGRAMME

UNDERGRADUATE VOCATIONAL STUDY IN MECHANICAL ENGINEERING

SPLIT, June 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	MECHANICAL ENGINEERING		
Provider of the study programme	FACULTY OF ELECTRICAL ENGINEERING, MECHANICAL ENGINEERING AND NAVAL ARCHITECTURE		
Other participants			
Type of study programme	Vocational study programme ☒	University study programme ☐	
Level of study programme	Undergraduate ☒	Graduate ☐	Integrated ☐
	Postgraduate ☐	Postgraduate specialist ☐	Graduate specialist ☐
Academic/vocational title earned at completion of study	Vocational Bachelor in Mechanical Engineering; bacc. ing. mech.		

1. INTRODUCTION

1.1. Reasons for starting the study programme

Mechanical Engineering is one of the fundamental areas of engineering sciences, which greatly contributes to creating surplus value and the increase of national income. In present times, mechanical engineering developed into a wide and interdisciplinary area, and there is virtually no human activity in which mechanical engineering does not play an important part, contributing to its development. Mechanical engineering encompasses a wide range of various engineering systems developed in machine engineering and applied in nearly all industrial sectors, including agriculture, construction engineering, chemical and processing industry, as well as medical sciences and a number of other economic activities.

Continuous and rapid developments in the modern world, resulting in new findings and achievements, necessarily require corresponding educational processes. Highly educated professionals are an essential prerequisite for advancement of society and keeping pace with the developed countries. Only through high quality education it is possible to successfully meet the challenges of rapid development and adapt to future technological challenges. Current advancements in mechanical engineering require from the experts to carry out less routine work and be more creative. What is expected of these professionals is to be capable to show competence in following the technological developments during their careers and to lead the technological development in their professional areas, using the intellectual abilities and the scope of their fundamental and professional education.

Such wide scope of necessary knowledge necessitates detailed research in corresponding basic disciplines in the fields of mathematics and natural sciences, branches of physics such as solid mechanics, mechanics of deformable bodies, fluid mechanics and thermodynamics, followed by a series of related disciplines such as electrical engineering and computer science, as well as social sciences (economics, management).

The area of activities of an expert with up-to-date education in the field of mechanical engineering encompasses all the stages of product life-cycle: construction (concept design), production and use, as well as recycling of the outphased product with the use of materials or product renewal and return to service. Environment protection is a special responsibility of a mechanical engineering expert. Reasonable use of physical and energy resources and special consideration for environment protection are necessary to fulfil the requirements of sustainable development.

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.
Fulfilling the purpose of the study programme in Mechanical Engineering is manifested in the number of students who successfully complete their studies and start their careers in almost all sectors of economy. Following the completion of studies, the acquired knowledge enables the students to find employment in various sectors, e.g. processing, chemical or 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.

1.3. Compatibility with requirements of professional organizations

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

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

FESB is a signatory to a number of cooperation agreements with the aim of promoting academic and educational activities, concluded with private enterprises and public organisations, e.g. Ericsson Nikola Tesla, Hrvatska elektroprivreda (national power company), Split-Dalmatia County, Ministry of Defense, Energy institute “Hrvoje Požar”, Croatian academic and research network - CARNet, Brodosplit, Siemens, Microsoft Croatia, HSTec, Solvis, Adria Winch, Odašiljači i veze, Manas, itd. 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

System of educating experts in the field of mechanical engineering differs a lot in the world and in Europe. During the implementation of teaching activities at the mechanical engineering programme, we continually observe the development of the higher education in the world, and especially in Europe. When developing the curriculum for the new study programme, special attention was directed at comparability of curricula with other distinguished foreign higher education institutions. The programme of the vocational study programme in Mechanical Engineering at FESB, in addition to traditional subject area of mechanical engineering, also includes materials science, production engineering and production management. These features are present in a number of other national and international study programmes in mechanical engineering in Central Europe.
With regard to curriculum and organisation, the undergraduate vocational study programme in Mechanical Engineering is highly comparable with related study programmes at renowned national and European higher education institutions, such as:

- Fakultet za strojništvo, Univerza v Ljubljani, Slovenija (University of Ljubljana, Faculty of Mechanical Engineering, Slovenia)
  http://www.fs.uni-lj.si/studijska_dejavnost/studijski_programi/

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

Undergraduate vocational study programme in Mechanical Engineering enables vertical and horizontal mobility of students. In terms of vertical mobility, undergraduate vocational study programme in Mechanical Engineering can be followed by a corresponding specialist graduate vocational study programme. In terms of horizontal mobility, undergraduate vocational study programme in Mechanical Engineering is open to mobility of students between related study programmes at all higher education institutions in Croatia or abroad. Students have the opportunity to complete a part of the study programme at a similar institution in Croatia or abroad. The comparability of the study programme with similar study programmes enables the students to fulfil a part of their course requirements at other higher education institutions in Croatia or abroad.

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

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

- EUROPA 2020 strategy for smart, sustainable and inclusive growth,
- Strategic documents of the European Research Area (ERA),

- Strategic documents of the European Higher Education Area (EHEA),
- Strategy of Education, Science and Technology of the Republic of Croatia.

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

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

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

1.9. Current experiences in equivalent or similar study programmes

FESB has extensive experience in delivering courses at similar programmes. As a response to growing demand for highly educated professionals in the fields of mechanical engineering and naval architecture, in 1960 the Centre for part-time studies was established in Split, as one of the constituent colleges of the Faculty of Mechanical Engineering and Naval Architecture in Zagreb. 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 Faculty has implemented professional studies (level VI in former qualifications system) since 1979 until today, with hiatus during the period 1998-2001. In collaboration with the Faculty of Mechanical Engineering and Naval Architecture in Zagreb the Faculty implemented the postgraduate study programme in mechanical engineering during the 1970s, with short interruptions. Permanent postgraduate study programme in Mechanical Engineering at FESB was established in 1998 and has been continually implemented since then. To this date, the academic degree of graduate engineer at the Faculty university undergraduate study in Mechanical Engineering was awarded to 654 students, and the vocational degree of mechanical engineer at the vocational study was awarded to 438 students.

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. New study programmes are developed in accordance with the recommendations of the European accreditation agencies. Undergraduate study programme in Mechanical Engineering was established, as well as graduate study programme in Mechanical Engineering with the following fields of study: Structures and Energy Technology, Computer-Aided Design and Engineering and Production Mechanical Engineering. Professional study programme in Mechanical Engineering was also established as a part of the Bologna Process, and in 2006 the postgraduate university study programme in Mechanical Engineering was established.

To this date, the university degree of Bachelor of Mechanical Engineering was awarded to 194 students, the degree of Master of Mechanical Engineering was awarded to 113 students, the degree of Vocational Associate in Mechanical Engineering was awarded to 47 students, the vocational degree of Bachelor of Mechanical Engineering was awarded to 36 students, the academic title of Master of Science in the academic field of mechanical engineering was awarded to 13 students and the academic title of the Doctor of Science in the scientific field of mechanical engineering and the scientific field of basic engineering sciences was awarded to 35 students.

Quality of education at FESB is confirmed by success and excellence of FESB graduates in the Croatian labour market, but also in the highly developed countries of the world. However, the most important is the fact that professionals trained at FESB represent a foundation of highly educated engineering labour force in the region.

2. DESCRIPTION OF THE STUDY PROGRAMME

2.1. General information

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

2.2. Learning outcomes of the study programme

The learning outcomes of the study programme are directly related to the learning outcomes of an individual course and represent learning outcomes to be achieved by each student who completes the undergraduate vocational study programme in Mechanical Engineering. The learning outcomes are aligned with the Croatian Qualification Framework Act.

KNOWLEDGE

1. To apply corresponding mathematical, physical and engineering principles in solving practical engineering problems.
2. To apply appropriate analytical methods in designing and solving complex mechanical engineering systems.
3. To consolidate the theoretical knowledge and practical skills in solving problems in the field of mechanical engineering,
4. To recognise the possibilities of applied methods and their limitations.
5. To develop creative solutions in development, construction, implementation and analysis of machine elements and devices.

SKILLS

6. To apply the techniques, skills and advanced engineering tools necessary in the engineering work.
7. To conduct experiments and measurements in laboratories and facilities, using modern measurement instruments.
8. To analyse the collected data and measurement results obtained in laboratories and production facilities.

9. To apply the engineering knowledge and skills to effectively resolve the engineering problems, both independently and as a part of team.
10. To prepare design documents and technical reports, using modern technologies.
11. To participate in the work of multidisciplinary and international teams.
12. To use the literature, databases and other sources of information.
13. To give a public presentation, to prepare a written report and present project results in Croatian and English.
14. To select and apply appropriate specialized procedures and computers tools for monitoring and maintenance of facilities, machines, tools and devices,
15. To calculate and design simple mechanical and thermal engineering systems.

INDEPENDENCE

16. To manage projects in the area of engineering, from the preparation stage to completion.
17. To adapt to new techniques and technologies.
18. To work in the field under unforeseen conditions.
19. To manage the maintenance of mechanical and industrial facilities.
20. To monitor the production and testing of mechanical equipment, devices and facilities in accordance with the design solutions.
21. To plan the development, production, testing, protection, maintenance and supervision of the facilities, machines, tools, devices and other machine equipment.

RESPONSIBILITY

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

2.3. Employment possibilities

Split is the economic and university hub of the entire Dalmatian region, as well as one part of the neighbouring region of Bosnia and Herzegovina. To respond to the demands of the development in the region, already in 1965 first two years of the study programme in Mechanical Engineering were established, with the purpose of educating professionals that would participate in the development of economy sectors based on mechanical engineering. Fulfilling the purpose of the study programme in Mechanical Engineering is manifested in the number of students who successfully complete their studies and start their careers in almost all sectors of economy. Following the completions of studies, the acquired knowledge enables the students to find employment in various sectors, e.g. processing, chemical or service industries. There is virtually no sector in which a graduate of the vocational study programme in Mechanical Engineering could not find employment. 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 mechanical engineering.

2.4. Possibilities of continuing studies at a higher level

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

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

2.6. Structure of the study

The study programme is structured per semesters, lasting 6 semesters, two in each academic year. Each semester corresponds to 30 ECTS credits. The final component of the study programme is preparing and defending the final paper. The conditions for enrolling a course are listed in the course table. Lectures are delivered in groups up to 100 students, auditory exercises and seminars in groups of 30 students, 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

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

2.11. Completion of study

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

2.12. List of mandatory and elective courses

List of courses								
Year of study: 1.								
Semester: I.								
STATUS	CODE	COURSE	HOURS IN SEMESTER					ECTS
			L	S	AE	LE	DE	
Mandatory	FEMY03	Mathematics	45	0	45	0	0	7
	FETR01	Materials	45	0	0	30	0	6
	FESR02	Engineering Mechanics 1	45	0	30	0	0	6
	FESY01	Introduction To Computer Applications	30	0	0	30	0	5
	FESR12	Technical Drawing And Descriptive Geometry 1	30	0	0	0	15	4
	FEOR02	English Language 1	0	30	0	0	0	2
	Total		195	30	75	60	15	30
	L = Lectures, S = Seminar, AE = Auditory Exercises, LE = Laboratory Exercises, DE = Design Exercises							
Elective	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	FESR03	Engineering Mechanics 2	45	0	45	0	0	7
	FESR04	Mechanics of Materials	45	0	30	0	0	6
	FEMY02	Applied Mathematics	30	0	30	0	0	5
	FESR18	Technical Drawing and Descriptive Geometry 2	30	0	0	0	30	5
	FETR02	Welding and Similar Treatments	45	0	0	15	0	5
	FEOR04	English Language 2	0	30	0	0	0	2
	Total		195	30	105	15	30	30
	L = Lectures, S = Seminar, AE = Auditory Exercises, LE = Laboratory Exercises, DE = Design Exercises							
Elective	There are no elective courses.							

List of courses								
Year of study: 2.								
Semester: III.								
STATUS	CODE	COURSE	HOURS IN SEMESTER					ECTS
			L	S	AE	LE	DE	
Mandatory	FETR12	Machining and Machine Tools	45	0	0	30	0	6
	FESR20	Thermodynamics	45	0	15	15	0	6
	FENR01	Electrical Engineering	30	0	15	15	0	5
	FESR14	Machine Elements 1	30	0	0	0	30	5
	FESR21	Fluid Mechanics	30	0	15	15	0	5
	FESY03	Introduction to Entrepreneurship	30	0	15	0	0	3
	Total		210	0	60	75	30	30
	L = Lectures, S = Seminar, AE = Auditory Exercises, LE = Laboratory Exercises, DE = Design Exercises							
Elective	There are no elective courses.							

List of courses								
Year of study: 2.								
Semester: IV.								
STATUS	CODE	COURSE	HOURS IN SEMESTER					ECTS
			L	S	AE	LE	DE	
Mandatory	FESR15	Machine Elements 2	30	0	0	0	45	7
	FESR22	Thermal and Hydraulic Machines	45	0	30	15	0	7
	FETR06	Production Preparing and Planning	45	0	0	0	30	6
	FETR05	Hydraulics and Pneumatics	30	0	0	15	15	5
	FETR04	Metal Forming by Deformation	30	0	0	30	0	5
	Total		180	0	30	60	90	30
	L = Lectures, S = Seminar, AE = Auditory Exercises, LE = Laboratory Exercises, DE = Design Exercises							
Elective	There are no elective courses.							

List of courses								
Year of study: 3.								
Semester: V.								
STATUS	CODE	COURSE	HOURS IN SEMESTER					ECTS
			L	S	AE	LE	DE	
Mandatory	FETR13	Industry Processes Automatic Control	30	0	0	30	0	5
	FESR10	Heating and Air Conditioning	30	0	30	0	0	5
	FESR19	Computer Aided Design	30	0	0	0	30	5
	FESR23	Metal Structures Design	30	0	0	0	30	5
	FETR07	Measurements in Engineering	30	0	0	30	0	5
	FETR08	Engineering Maintenance	30	0	30	0	0	5
	Total		180	0	60	60	60	30
	L = Lectures, S = Seminar, AE = Auditory Exercises, LE = Laboratory Exercises, DE = Design Exercises							
Elective	There are no elective courses.							

List of courses								
Year of study: 3.								
Semester: VI.								
STATUS	CODE	COURSE	HOURS IN SEMESTER					ECTS
			L	S	AE	LE	DE	
Mandatory	FEYY03	Professional Training						10
		Elective Course 1						
		Elective Course 2						
	FEYY01	Final Thesis						10
	Total		0	0	0	0	0	20
Elective	FESS35	Marine Machinery and Devices	30	0	30	0	0	5
	FETR10	Economics and Production Organization	30	0	0	30	0	5
	FESL24	Energy Efficiency in Buildings	30	0	30	0	0	5
	FESR17	Renewable Energy Sources and Sustainable Development	30	0	30	0	0	5
	FETR15	Tribology Basics	30	0	30	0	0	5
	FETR14	Computer Aided Manufacturing	30	0	0	0	30	5
	FESR24	Transport in Industry	30	0	30	0	0	5
	FESR25	Wind Farms and Hybrid Energy Systems	30	0	30	0	0	5
	FESR16	Noise and Vibration Control	30	0	15	15	0	5
	Two elective courses are chosen.							

2.13. Course description

<table>
<tr><td>NAME OF THE COURSE</td><td colspan="6">APPLIED MATHEMATICS</td></tr>
<tr><td>Code</td><td>FEMY02</td><td>Year of study</td><td colspan="5">1</td></tr>
<tr><td>Course teacher</td><td>Ivančica Mirošević, Lecturer</td><td>Credits (ECTS)</td><td colspan="5">5</td></tr>
<tr><td rowspan="2">Associate teachers</td><td rowspan="2">Lea Dujić, Teaching assistant</td><td rowspan="2">Type of instruction (number of hours)</td><td>L</td><td>S</td><td>AE</td><td>LE</td><td>DE</td></tr>
<tr><td>30</td><td>0</td><td>30</td><td>0</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">10</td></tr>
<tr><td colspan="7">COURSE DESCRIPTION</td></tr>
<tr><td>Course objectives</td><td colspan="6">Training students for:
• application of mathematical concepts and tools from the area of ordinary differential equations, numerical mathematics, statistics and probability to analyze and solve engineering problems.</td></tr>
<tr><td>Course enrolment requirements and entry competences required for the course</td><td colspan="6">Good knowledge of High School mathematics and passed State Exam in Mathematics.</td></tr>
<tr><td>Learning outcomes expected at the level of the course (4 to 10 learning outcomes)</td><td colspan="6">Students will be able to:

- state definitions and theorems from the enitre course,
- illustrate theorems with examples,
- solve some first and second order differential equations,
- apply Laplace transform to linear differential equations
- find approximate solution of a nonlinear equation
- approximate function with Lagrange interpolation polynomial
- approximate empirical data with constant, linear or quadratic function
- solve definite integral and Cauchy problem of the first order approximately
- use statistical techniques in data analysis
- find probability distributions of random variables in random experiments</td></tr>
<tr><td rowspan="11">Course content broken down in detail by weekly class schedule (syllabus)</td><td colspan="4">Course content</td><td>L or S hours</td><td>AE hours</td></tr>
<tr><td colspan="4">1. Introduction to Differential Equations. Basic concepts and definitions. Equations with separable variables.</td><td>2</td><td>2</td></tr>
<tr><td colspan="4">2. Homogeneous differential equations. Linear differential equations of the first order.</td><td>2</td><td>2</td></tr>
<tr><td colspan="4">3. Differential equations of ¸the second order. Linear differential equations of the second order with constant coefficients.</td><td>2</td><td>2</td></tr>
<tr><td colspan="4">4. Laplace transform – definition and basic properties. Inverse Laplace transform and basic properties.</td><td>2</td><td>2</td></tr>
<tr><td colspan="4">5. Solving linear differential equations with with constant coefficients using Laplace transform.</td><td>2</td><td>2</td></tr>
<tr><td colspan="4">6. Introduction to Numerical mathematics. Solving nonlinear equations. Graphical method. Bisection method. Iterative method.</td><td>2</td><td>2</td></tr>
<tr><td colspan="4">7. Lagrange interpolation polynomial</td><td>2</td><td>2</td></tr>
<tr><td colspan="4">8. Least square method. Approximating empirical data with constant, linear or quadratic function.</td><td>2</td><td>2</td></tr>
<tr><td colspan="4">9. Numerical integration. Trapezoidal rule. Simpson's rule. Euler's method for Cauchy problems.</td><td>2</td><td>2</td></tr>
<tr><td colspan="4">10. Descriptive statistics. Discrete data and continuous data.</td><td>2</td><td>2</td></tr>
</table>

	Numerical characteristics.		
	11. Introduction to Probability theory. Elementary outcomes. Basics of Combinatorics.	2	2
	12. Discrete random variable. Expectation and variance. Binomial distribution. Poisson distribution.	2	2
	13. Continuous random variable. Expectation and variance. Normal distribution.	2	2
	List of laboratory or design exercises		LE or DE hours

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

Screening student work *(name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)*						
	Class attendance	2	Research		Practical training	
	Experimental work		Report		Self study	2.6
	Essay		Seminar essay		(Other)	
	Tests	0.2	Oral exam		(Other)	
	Written exam	0.2	Project		(Other)	

Grading and evaluating student work in class and at the final exam	During semester two mid-term exams are held. The first exam is scheduled after 7 weeks of lectures, and the second in the week following the lectures. At each mid-term exam students can get 40 points, while the remaining 20 points are attained through assignements during lectures and excercises. The condition for passing the course is minimum 20 points on each mid-term exams and a total of at least 50 points. After semester, two final exams and a correction exam are held. Students which did not pass one mid-term exam, can take only this part of the exam during final exams. Students which did not pass any mid-term exam, take the final exam with comprehensive course content. In that case, maximum numbers of available points is 80. The condition for passing the course is minimum 40 points in the final exam and a total of at least 50 points. The grade is formed after the second final exam according to article 75 of the Statute of FESB: 15% of the best students get the mark excellent (5), next 35% students get the mark very good (4), next 35% students get the mark good (3), and the last 15% students get thet mark sufficient (2). Students who did not pass the course after final exams, and have obtained total of at least 10 points, can attend the correction exam. On the correction exam maximal number of points is 100, and the minimum requirement for a passing grade is 50 points. Mid-term exams, final exams and correction exams are held according to the exam schedule.

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

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

NAME OF THE COURSE	COMPUTER AIDED DESIGN						
Code	FESR19	Year of study	3				
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 and application of basic terms and principles of feature-based modeling, parametric modeling, and geometric modeling, • ability to build simple models, assemblies, and technical drawings by using a geometric modeling tool, • ability to solve simple engineering problems by using a spreadsheet tool.		
Course enrolment requirements and entry competences required for the course	Passed Mathematics 1 exam.		
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	Students will be able to: 1. explain fundamental principles of geometric modeling, parametric modeling, and feature based modeling, 2. describe an importance and available approaches to the exchange of design data between the different CAD systems, 3. use a computer aided design tool, 4. construct simple geometric models and assemblies, 5. solve simple engineering problems by using a spreadsheet tool, 6. draw a graph by using a spreadsheet tool, 7. calculate a surface area by using a Simpson's Rule.		
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	
	Introduction to CAD/CAM/CAE systems, part I: applications; the expansion of 3D CAD technology; acquiring and installation of Creo Parametric computer program.	2	
	Introduction to CAD/CAM/CAE systems, part II.	2	
	Elements of CAD/CAM/CAE systems; hardware; software.	2	
	Geometric modeling; feature based modeling; parametric modeling.	2	
	CAD data structures; exchange of design data between the different CAD systems.	2	
	A brief on structural analysis.	2	
	First midterm exam		
	History of computing and computers; computer representation of numbers; engineering calculations.	2	
	„Handle numbers with care“: numerical examples; sample workbooks.	2	
	Graphical representation of engineering results.	2	
	Numerical integration; equations; systems of equations.	2	
	Applications: propeller mass moment of inertia.	2	
	Applications: pump plant rating.	2	

	Second midterm exam	
	List of laboratory or design exercises	LE or DE hours
	The environment of CAD design tool; extrusion of a closed curve.	2
	Sketch tool; extrude; round; chamfer; hole; parameters.	2
	Revolving of a closed curve.	2
	Design planes.	2
	Sections; shells, constraints; sketching utilities.	2
	Making assemblies.	2
	Technical drawing preparation.	2
	Spreadsheet tool elements; making a simple worksheet; built-in functions.	2
	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.	2
	System of equations: linear systems; nonlinear systems.	2

Format of instruction	☒ lectures ☐ seminars and workshops ☒ exercises ☐ *on line* in entirety ☒ partial e-learning ☐ field work	☐ independent assignments ☒ multimedia ☒ laboratory ☐ work with mentor ☒ computer work (other)
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: 17 theoretical questions and two design problems; second exam: five theoretical questions and three numerical 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	-	Link at

	studijski centar za stručne studije, Split, 2010.		e-learning portal
Optional literature (at the time of submission of study programme proposal)	8. K. Lee: Principles of CAD/CAM/CAE Systems, Addison-Wesley, Reading, 1999. 9. C. McMahon, J. Browne: CADCAM: Principles, Practice and Manufacturing 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	COMPUTER AIDED MANUFACTURING						
Code	FETR14	Year of study	3				
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	0	30
Status of the course	Elective	Percentage of application of e-learning					

COURSE DESCRIPTION

Course objectives	Training students for: • exploring the possibilities of computer application in production with an emphasis on programming CNC machine tools and additive technology. • mastering of manual programming and programming in CAD / CAM systems in machining of simple workpiece.		
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. analyze interactions and need for a comprehensive approach to part design and their manufacturing 2. apply acquired knowledge and skills to solve a specific task. 3. apply acquired knowledge and skills in teamwork. 4. generate program for the automatic parts production on CNC machine tools 5. compare and highlight differences between manual programming and programming by CAD / CAM systems 6. identify motives of applying computer controlled machine tools and systems for rapid prototyping		
Course content broken down in detail by weekly class schedule (syllabus)	Course content	L or S hours	AE hours
	Introduction. Basic terms. Historical development.	2	/
	Geometric modeling.	2	/
	CNC machine tools programming. NC and CNC programming.	2	/
	Analysis of technical drawings. Technological documentation. Programming methods. Manual programming. Automatic programming.	2	/
	CNC machine tools programming. Coordinate system. Measurement system. Reference points. Defining cutting tools. The structure of the program block.	2	/
	CNC turning. The procedure and machine tools. Tools for turning.	2	/
	CNC turning. Selection of cutting parameters. Manually programming CNC turning.	2	/
	First midterm exam		
	Automatic programming of CNC lathes.	2	/
	CNC milling. Different machining operations and machine tools. Tools clamping. Tools storage. Manipulation with tool and workpiece.	2	/
	CNC milling. End milling. Face milling. Profile milling.	2	/
	CNC milling. Manually programming.	2	/

	CNC milling. Automatic programming in CATIA.	2	/
	Rapid prototyping.	2	/
	Second midterm exam		
	List of laboratory or design exercises		LE or DE hours
	Construction of simple geometric shapes and their extrusion.		2
	Construction of complex geometric shapes and their extrusion.		4
	Technical documentation - Drafting module.		2
	CNC manual programming for lathes.		4
	Automatic programming - turning. Roughing and finishing, holes and threads		2
	Module for machining – Single opeartion: milling. Roughing. Generating NC code for machining center.		2
	Communication between computers and machining center. Machining on CNC vertical machining center Spinner VC560.		2
	Module for machining – multitasking: milling - Roughing and finishing, holes. Generating NC code for machining center.		2
	Communication between computers and machining center. Machining on CNC vertical machining center Spinner VC560.		2
	Simulating and generating NC code. Machining on CNC vertical machining center Spinner VC560.		2
	Rapid prototyping. STL files. 3D printing		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		Manual programming of turning operation	0,5
	Essay		Seminar essay		Individual work	2,25
	Tests	0,25	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. Positively evaluated program task "Manually programming CNC turning"
2. 50 % points on each midterm exam or the final exam.

Grade (in percentage) is formed according to the formula:

$$\text{Grade}(\%) = 0{,}2\ L + 0{,}4\ (M1 + M2)$$

L – grade of program task "Manually programming CNC turning"
M1, M2 – test results of first and second midterm exam.
Final grade is determined according to:
Percentage Grade

<table>
<tr><td></td><td colspan="3">50% do 61% sufficient (2)
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>Bajić, D., Jozić, S., "Computer aided manufacturing“, lecturing, eLearning, 2015.</td><td></td><td>eLearning portal</td></tr>
<tr><td>Optional literature (at the time of submission of study programme proposal)</td><td colspan="3">Balič, J.: CAD/CAM postopki, Univerza v Mariboru, Maribor, 2002.
McMahon, C., Brown, J.: CAD CAM principles, practice and manufacturing management, Pearson Prentice Hall, 1999.</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	ECONOMICS AND PRODUCTION ORGANIZATION						
Code	FETR10	Year of study	3.				
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	0	30	0
Status of the course	Elective	Percentage of application of e-learning	0				

COURSE DESCRIPTION

Course objectives	Training students for: • understanding basic knowledge of production organization theory, and new organization structures • solving problem of profitability (based on income and cost) and equilibrium point (based on supply and demand)		
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. define the difference between classic and neoclassic organization theories 2. define the modern theories of organization 3. define outer and inner factors that affect the selection of organization structure 4. calculate fixed and variable costs 5. calculate equilibrium point		
Course content broken down in detail by weekly class schedule (syllabus)	Course content	L or S hours	AE hours
	Introduction. Organization basics.	2	2
	Theory of organization (classic, neoclassic, modern). Modelling of organization structures.	2	2
	Types of organization structures.	2	2
	Modern trends in organization modelling.	2	2
	Lean Management (VS,5S, kaizen)	2	2
	Toyota Production System.	2	2
	Parallel engineering, fractal factory.	2	2
	Networked factory (virtual factory), business process reengineering, agile manufacturing.	2	2
	Organization of material factors. Organization of human resources.	2	2
	Organization of control and management. Organization dynamics.	2	2
	Enterprise, entrepreneurship, entrepreneur. Legal entities of enterprise. Types of integration of enterprise.	2	2
	Organization of business functions.	2	2
	Theory of production and costs. Theory of production. Optimal combination of production factors. Production costs.	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)	

<table>
<tr><td>Student responsibilities</td><td colspan="6"></td></tr>
<tr><td rowspan="6">Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)</td><td>Class attendance</td><td>2,0</td><td>Research</td><td></td><td>Practical training</td><td></td></tr>
<tr><td>Experimental work</td><td></td><td>Report</td><td></td><td>Individual work (Other)</td><td>3,0</td></tr>
<tr><td>Essay</td><td></td><td>Seminar essay</td><td></td><td>(Other)</td><td></td></tr>
<tr><td>Tests</td><td>0</td><td>Oral exam</td><td></td><td>(Other)</td><td></td></tr>
<tr><td>Written exam</td><td></td><td>Project</td><td></td><td>(Other)</td><td></td></tr>
<tr><td colspan="6"></td></tr>
<tr><td>Grading and evaluating student work in class and at the final exam</td><td colspan="6">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. Each midterm test consists of 5 theoretical questions and lasts for 45 minutes. The midterm and final exams are carried out as written tests. The requirement for passing grade is the positive grade of AE test (exercise on inventory management at the end of semester) 40 % points on each midterm exam or the final exam. Grade (in percentage) is formed according to the formula:
Grade(%) = 0,20 AE + 0,4 (M1 + M2)
the activities in percentage:
- AE – grade of AE test,
- M1, M2 – test results.
Final grade is calculated after the second final exam based on the ECTS relative grade system in accordance to Regulations of studies and studying system of University of Split. Students that passed the exam are divided into the four groups: 15% best ones are given grade excellent, next 35% are given grade very good, next 35% grade good, and last 15% grade sufficient. Students that didn’t pass the exam after second final exam write correction exam on the autumn and maximum grade they can get is sufficient. Correction exam is test of the whole curriculum of the course. It is a written test consisting of 10 theoretical questions and lasts for 45 minutes.</td></tr>
<tr><td rowspan="6">Required literature (available in the library and via other media)</td><td colspan="3">Title</td><td>Number of copies in the library</td><td colspan="2">Availability via other media</td></tr>
<tr><td colspan="3">Dulčić, Ž.; Pavić, I.; Rovan, M.; Veža, I.: Proizvodni menedžment. Fakultet elektrotehnike, strojarstva i brodogradnje – Ekonomski fakultet, Split, 1996.</td><td>5</td><td colspan="2"></td></tr>
<tr><td colspan="3">Sikavica P.; Novak, M.: Poslovna organizacija, informator, Zagreb, 2011.</td><td>5</td><td colspan="2"></td></tr>
<tr><td colspan="3"></td><td></td><td colspan="2"></td></tr>
<tr><td colspan="3"></td><td></td><td colspan="2"></td></tr>
<tr><td colspan="3"></td><td></td><td colspan="2"></td></tr>
<tr><td>Optional literature (at the time of submission of study programme proposal)</td><td colspan="6">- Schroeder, R.G.: Upravljanje proizvodnjom, Mate, Zagreb, 2000</td></tr>
<tr><td>Quality assurance methods that ensure the acquisition of exit competences</td><td colspan="6">- Assessment of students presence on lectures
- Annual institutional evaluation of students success on exams
- Feedback from students via surveys
- Self-evaluation of teachers
- Feedback from faculty alumni students of the importance of the curriculum of courses</td></tr>
</table>

Other (as the proposer wishes to add)	

NAME OF THE COURSE	ELECTRICAL ENGINEERING						
Code	FENR01	Year of study	2.				
Course teacher	Ivica Jurić-Grgić, Ph. D., Associate Professor Nedjeljka Grulović – Plavljanić, Senior Lecturer	Credits (ECTS)	5				
Associate teachers		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	Training students for: • application of basic principles and laws of electrical engineering, • setting up and solving simple electrical circuits, • permanent adoption of basic knowledge in the field of electrical machines.		
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. define the fundamental phenomena, the quantities and the laws of electrical engineering, 2. apply fundamental laws of electrical engineering for the calculation of electromagnetic quantities, 3. analyse simple electrical networks, 4. measure basic electrical values (current, voltage, resistance). 5. describe basic principles of electrical machines.		
Course content broken down in detail by weekly class schedule (syllabus)	Course content	L hours	AE hours
	Basic terms. Electrostatics:electricity and physical property of matter. Coulomb's law; Electric field; Electric flux density, Gauss's law.	2	1
	Electrostatics:Electrical work, electrostatic voltage,electrostatic potential, capacitance, capacitance of the capacitors.	2	1
	Electrostatics: Matter in electrical field, capacitors; static electricity; lightning protection.	2	1
	DC currents: Electric circuits; electrical property of matter; Electrical conductivity and electrical resistance; voltage and current sources; Ohm's law; temperature dependence of electrical resistance; series, parallel and combination circuits.	2	1
	DC currents: Kirchhoff's Laws; power and energy of DC current.	2	1
	DC currents: Current and voltage measurements; electrical resistance measurement; Wheatstone bridge; Wye–Delta transformation; circuit analysis techniques; electrolysis and chemical sources of electric current.	2	2
	Magnetism: Basics of magnetism; natural magnet and *electromagnet; magnetic flux; Faraday's law; magnetic forces on moving charges and on a current-carrying wire; magnetic force between two parallel current-carrying wires;Biot–Savart law; Ampere's Law;toroidal solenoid.*	2	1
	Magnetism: Mutual and self inductance; leakage of magnetic flux; ferromagnetism; magnetic hysteresis;	2	1

	magnetic circuit; magnetic energy; magnetic force.		
	AC currents: Current and voltage sinusoidal waveform; form and crest factor; generation of a voltage sinusoidal waveform; Euler's formula for complex numbers; phase relationships in AC Circuits; Ohm's law in complex form; resistive and reactive impedance in AC Circuits; series, parallel and combination AC circuits.	2	2
	AC currents: Power and energy of AC current; circuit analysis techniques using complex numbers; three-phase AC circuits.	2	2
	Transformers	2	0
	Synchronous machines	2	0
	Induction motors	1	0
	DC motors; universal motors.	1	0
	List of laboratory exercises		LE hours
	Series, parallel and combination DC circuits		3
	Kirchhoff's Laws and Thévenin's theorem		3
	Resistive and reactive impedance in AC Circuits		3
	Power of AC current		3
	Open circuit test on transformer		3

Format of instruction	☒ lectures ☐ seminars and workshops ☒ exercises ☐ *on line* in entirety ☐ partial e-learning ☐ field work	☐ independent assignments ☒ multimedia ☒ laboratory ☐ work with mentor ☐ (other)
Studentresponsibilities	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 eachactivity so that the total number of ECTS credits is equal to the ECTS value of the course)*	Class attendance	1	Research		Practical training	
	Experimental work		Report		Individual work	3
	Essay		Seminar essay		Laboratory exercises	0,5
	Tests	0,2	Oral exam		Preparation for laboratory exercises	0,2
	Written exam	0,1	Project		(Other)	

Grading and evaluating student work in class and at the final exam	During the semester there will be two midterm tests. The first test will be at the eighth week of classes, the second at the first week of the exam period. Student can pass the entire exam by midterm tests. At the two final exams, students take parts of the curriculum that did not pass by midterm tests. If at the first final exam student passes one of the two parts of curriculum that part of curriculum the student does not have to take on another final exam. The condition for positive assessment is that the student has at least 50% of each part of the curriculum at the midterm tests or at the final exams. The final grade (in percent) is formed on the basis of all activities according to the formula: Rating (%) = 0.1 * LV + 0.45 * (G1 + G2) wherein the activity is expressed in percentage according to: LV -percentage obtained by laboratory exercises, G1, G2 - percentage obtained by midterm tests or final exams of the parts of curriculum given in lectures.

<table>
<tr><td></td><td colspan="3">Students who did not pass the exam after two final exams can pass the exam at the last week of August or the first week of September. Last chance to take the exam in this school year is a so-called commission exam. In a so-called commission exam all students take the entire curriculum, and the condition for positive assessment is that the student has at least 50% of entire curriculum.

The final score (in percentage) is formed on the basis of all activities according to the formula:

Rating (%) = 0.1 * LV + 0.9 * G

wherein the activity is expressed in percentage according to:

LV -percentage obtained by laboratory exercises,
G - percentage obtained by exams of the entire curriculum given in lectures.

The final grade is determined as follows:

Rating Grade
50% to 61% sufficient (2)
62% to 74% good (3)
75% to 87% very good (4)
88% 100% excellent (5)</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>I. Jurić-Grgić: Lectures, FESB</td><td></td><td>e-learning portal</td></tr>
<tr><td>Optional literature (at the time of submission of study programme proposal)</td><td colspan="3">A. Maletić: Osnove elektrotehnike, ELMAP, Split, 1993.
R. Wolf: Osnove električnih strojeva, Školska knjiga, Zagreb, 1985.</td></tr>
<tr><td>Quality assurance methods that ensure the acquisition of exit competences</td><td colspan="3">– Evaluation of students presence on lectures
– Evaluation of results in accordance with the above learning outcomes
– Feedback from students via surveys
– Self-evaluation of teachers
– 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	ENERGY EFFICIENCY IN BUILDINGS						
Code	FESL24	Year of study	3.				
Course teacher	Nižetić Sandro, Ph. D., Full 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: • Consider and analyse energy consumption in the buildings, • Obtain techno-economic aspect of proposed energy efficiency measures in building facilities.		
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: 1. Consider base terms and concepts from the field of energy efficiency in buildings as well as sustainable development in general, 2. Analyse energy consumption in buildings, 3. Elaborate existing legislative related to the energy efficiency in buildings, 4. Analyse and propose energy efficiency measures in buildings, 5. Evaluate economic aspect of proposed energy efficiency measures.		
Course content broken down in detail by weekly class schedule (syllabus)	Course content	L or S hours	AE hours
	Introduction to the energy efficiency in buildings.	2	2
	Analysis of the energy consumption for different buildings.	2	2
	Legislative related to the energy efficiency in buildings.	2	2
	Introduction to the energy efficiency measures in buildings (passive and nearly zero buildings, high energy performance buildings).	2	2
	Energy efficiency measures related civil engineering aspect (building thermal envelope, openings, passive architecture elements, etc.)	2	2
	Energy efficiency measures in heating systems and hot water preparation.	2	2
	Energy efficiency measures in heating systems and hot water preparation.	2	2
	Energy efficiency measures in cooling (air-conditioning) systems.	2	2
	Energy efficiency measures in cooling (air-conditioning)	2	2

	systems.		
	Renewable energy sources in buildings (implementation).	2	2
	Calculation techniques for carbon-dioxide emissions.	2	2
	Energy audit.	2	2
	Building energy certification.	2	2
	Introduction to the economic indicators related to the evaluation of the energy efficiency measures.	2	2
	Economic evaluation of the proposed energy efficiency measures.	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 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; Energetska učinkovitost u zgradarstvu, 2011, FESB.		
	Energy Efficiency in Buildings'' – Guide F, CIBSE, 2004.		
	Energy Efficiency Guide for Existing Commercial		

	Buildings'', Guide, ASHRAE, 2009.		
Optional literature (at the time of submission of study programme proposal)	-Skupina autora, "Priručnik za energetske savjetnike", UNDP, Zagreb 2008, -Skupina autora, "Tipske mjere", UNDP, Zagreb 2009, -Skupina autora, "Priručnik za ventilaciju i klimatizaciju", EGE, 2003, -Skupina autora, "Priručnik za grijanje", EGE, 2005.		
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	ENGINEERING MAINTENANCE						
Code	FETR08	Year of study	3				
Course teacher	Jani Barle	Credits (ECTS)	5				
Associate teachers	Stipe Perišić	Type of instruction (number of hours)	L	S	AE	LE	CE
			30	0	30	0	0
Status of the course	Obligatory	Percentage of application of e-learning	0				

COURSE DESCRIPTION

Course objectives	Training students to: become thoughtful on the maintenance role and scope with respect to technical system usage, participate in the data collection and analysis for planning and governing maintenance related corrective, preventive and predictive actions.		
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. Comment on influences of maintenance procedures on availability. 4. Compare impacts on technical system service life. 5. Prepare life assessment and durability related documents.		
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.	2	
	Maintenance-related case studies.		2
	Historical aspects, principles and applications of maintenance actions (corrective, preventive, predictive, proactive). RCM and TPM strategies.	2	
	Case studies and examples of maintenance principles.		2
	Technical performance indicators. Failure, failure cause, failure mode and consequence. Failure Mode and Effect Analysis (FMEA) and Root Cause Analysis (RCA).	2	
	FMEA examples.		2
	First failure reliability principles and models.	2	
	Fundamental aspects of reliability - models.		2
	Component design life. Burn-in. Life data analysis. Censored data in survival analysis.	2	
	Nonparametric life data analysis.		2
	Parametric reliability models of component. Constant and time-dependent failure models (Exponential, Weibull, Log-normal). Probability plots.	2	
	Parametric life data analysis.		2
	Reliability of systems. Reliability block diagrams (RBD): serial configuration and redundancy models.	2	
	Redundancy, models compliant to the IEC EN 61508 (k-out-of-n, active, passive, stand-by, load sharing).		2
	Maintainability and availability.	2	
	Maintainability and availability: a case study.		2
	Modeling and analysis of repairable items. Markov model fundamentals.	2	

	Examples of repairable items modeling.		2
	The role and applications of technical diagnostics. Procedure, types, indicators and sensors.	2	
	Technical diagnostics: a case study.		2
	Physical reliability models.	2	
	Covariate damage models (mechanical stress, temperature).		2
	Optimal preventive maintenance scenarios and models.	2	
	Numerical analysis of optimal preventive maintenance modes (planned and opportunistic).		2
	Computerized Maintenance Management System (CMMS). Maintenance structure and policy.	2	
	CMMS elements: a case study.		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	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 informacijski sustavi održavanja", SFSB, Slavonski Brod 1999.	7	
Optional literature (at the time of submission of study programme proposal)	Rausand, M.; Høyland, A., "System Reliability Theory: Models, Statistical Methods, and Applications", 2nd ed., Wiley-Interscience, 2003. Ebeling, C., "An Introduction To Reliability and Maintainability Engineering", McGraw-Hill, 1996.		
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">ENGINEERING MECHANICS 1</td></tr>
<tr><td>Code</td><td>FESR02</td><td>Year of study</td><td colspan="4">1.</td></tr>
<tr><td>Course teacher</td><td>Vedrana Cvitanić, Ph. D., Associate Professor
Marko Vukasović, Ph. D., Teaching Assistant</td><td>Credits (ECTS)</td><td colspan="4">6</td></tr>
<tr><td rowspan="2">Associate teachers</td><td rowspan="2">Branka Bužančić Primorac, Ph. D., Teaching assistant
Maja Kovačić, 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>30</td><td>0</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="4">0</td></tr>
<tr><td colspan="7">COURSE DESCRIPTION</td></tr>
<tr><td>Course objectives</td><td colspan="6">Training students for:
• understanding and application of basic knowledge of mechanics of rigid bodies (statics),
• understanding of basic concepts in mechanics such as force, moment of force, couple as well as system of forces (from concurrent force system to spatial parallel force system),
• studying equilibrium of body and equilibrium of body systems,
• determination of internal forces in beams.</td></tr>
<tr><td>Course enrolment requirements and entry competences required for the course</td><td colspan="6">None</td></tr>
<tr><td>Learning outcomes expected at the level of the course (4 to 10 learning outcomes)</td><td colspan="6">Students will be able to:
• explain fundamental concepts and terms of statics (force, moment of the force, couple, moment of the couple, force system, supports, reaction forces, external forces, internal forces),
• perform composition of force systems, from the concurrent force system to spatial parallel force system,
• apply equilibrium conditions for body and for system of bodies,
• calculate reaction forces of the statically determinate plane structures,
• consider and apply calculation of friction forces as well as calculation of friction of flexible belts,
• determine distributions of the components of the internal forces in statically determinate beams (beams, frames, trusses, circular beams, spatial plane beams)
• determine centroid of homogenous bodies with composed shape.</td></tr>
<tr><td rowspan="5">Course content broken down in detail by weekly class schedule (syllabus)</td><td colspan="3">Course content</td><td>L hours</td><td colspan="2">AE hours</td></tr>
<tr><td colspan="3">Mission of statics. Force. Axioms of statics. Supports. Reactions of supports.</td><td>2</td><td colspan="2">1</td></tr>
<tr><td colspan="3">System of concurrent forces. Composition of system of concurrent forces. Resultant. Determination of force components. Force projection on axis. Force projection on plane. Analytical defining of force. Equilibrium conditions of system of concurrent forces.</td><td>3</td><td colspan="2">3</td></tr>
<tr><td colspan="3">Moment of force about point. Varignon theorem about moment of resultant of planar system of concurrent forces. Special forms of equilibrium conditions of planar system of concurrent forces.</td><td>3</td><td colspan="2">2</td></tr>
<tr><td colspan="3">Coplanar system of parallel forces and couples. Composition of two parallel forces. Couple. Moment of couple. Equivalence of couples. Composition of coplanar system of couples. Equilibrium conditions of</td><td>3</td><td colspan="2">1</td></tr>
</table>

	coplanar system of couples.		
	Coplanar force system. Theorem about reduction of force about point. Reduction of coplanar force system. Representing coplanar force system in simpler form. Equilibrium conditions of coplanar force system. Equilibrium conditions of coplanar system of parallel forces. Equilibrium of planar rigid body systems.	4	4
	Friction. Sliding friction. Reaction of rough surface. Friction angle and friction cone. Equilibrium under friction conditions. Friction of flexible belts. Rolling friction.	5	3
	First midterm exam		
	Plane beams. Internal force components of plane beams. Relations between internal force components and external loading.	3	3
	Examples of plane beams.	3	3
	Plane trusses. Plane arcs.	2	2
	Spatial system of parallel forces and couples. Moment of force about axis. Equivalence of couples acting in parallel planes. Composition of spatial system of couples. Equilibrium conditions of spatial system of couples.	3	3
	Composition of spatial system of parallel forces. Representation of spatial system of parallel forces in simpler form. Equilibrium conditions of spatial system of parallel forces. Varignon theorem about moment of resultant of spatial system of parallel forces.	3	2
	Spatial plane beams. Internal force components of spatial plane beams. Examples of spatial plane beams.	2	1
	Center of system of parallel forces. Centroid. Centroid of rigid bodies. Centorid of homogenous bodies. Centorid of homogenous bodies with composed shape. Experimental determination of body centroid. Pappus-Guldin rules.	3	1
	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 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	2,5	Research		Practical training	
	Experimental work		Report		Individual work	3,2
	Essay		Seminar essay		Laboratory exercises	
	Tests	0,2	Oral exam		Preparation for laboratory exercises	
	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. Grade (in percentage) is formed according to the formula: Grade(%) = 0,5 (M1 + M2) the activities in percentage: • M1, M2 – test results.

	Title	Number of copies in the library	Availability via other media
Required literature (available in the library and via other media)	Pavazza, R.: Tehnička mehanika, Statika, Sveučilište u Splitu, Fakultet elektrotehnike, strojarstva i brodogradnje, Split, 2007.	10	
	Plazibat, B., Matoković, A., "Mehanika 1 – zbirka zadataka“, FESB, Split, 1999.		
Optional literature (at the time of submission of study programme proposal)	– Pavazza, R.: Mehanika - Statika, Školska knjiga, Zagreb, 2014. – Bazjanac, D.: Tehnička mehanika, Statika, Tehnička knjiga, Zagreb, 1974. – Muftić, O.: Mehanika I, Statika, Tehnička knjiga, Zagreb, 1989. – Meriam, J. L., Kraige, L. G.: Engineering Mechanics-Statics, John Wiley & Sons, 2003. – Brnić, J.: Statika, Sveučilište u Rijeci, Tehnički fakultet, Rijeka, 2004. – Matejiček, F., Semenski D., Vnučec, Z., "Uvod u statiku sa zbirkom zadataka", Golden marketing - Tehnička knjiga, Zagreb, 2005. – Alfirević, I., Saucha, J., Tonković, Z., Kodvanj, J., Uvod u mehaniku I. Statika krutih tijela, II. Primjenjena statika, Golden marketing-Tehnička knjiga, Zagreb, 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)			

<table>
<tr><td>NAME OF THE COURSE</td><td colspan="6">ENGINEERING MECHANICS 2</td></tr>
<tr><td>Code</td><td>FESR03</td><td>Year of study</td><td colspan="4">1</td></tr>
<tr><td>Course teacher</td><td>Željan Lozina, Ph. D. Full Professor, Damir Sedlar, Ph.D., AssistantProfessor</td><td>Credits (ECTS)</td><td colspan="4">7</td></tr>
<tr><td rowspan="2">Associate teachers</td><td rowspan="2">Damir Sedlar, Ph. D., Assistant Professor</td><td rowspan="2">Type of instruction (number of hours)</td><td>L</td><td>S</td><td>AE</td><td>LE</td><td>DE</td></tr>
<tr><td>45</td><td>0</td><td>45</td><td>0</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="4">0</td></tr>
<tr><td colspan="7">COURSE DESCRIPTION</td></tr>
<tr><td>Course objectives</td><td colspan="6">Training students for: This course will introduce the fundamentals of engineering dynamics. It will develop the skills in how to model and analyses the motion of particles and rigid bodies as a foundation for dynamic analysis of mechanical systems. This fundamental course will also help develop engineers eyes to understand how machines work, and develop an engineering mind set to present and communicate work in a clear and concise written format.</td></tr>
<tr><td>Course enrolment requirements and entry competences required for the course</td><td colspan="6">None</td></tr>
<tr><td>Learning outcomes expected at the level of the course (4 to 10 learning outcomes)</td><td colspan="6">Students will be able to:
1. Apply kinematics of the three-dimensional particle motion in various coordinate systems: Cartesian, natural and cylindrical.
2. Explain the concepts of displacement, velocity and acceleration as vectors and how to determine them.
3. Explain the notion of a force as a vector.
4. Explain concepts of kinetic, potential and mechanical energies and the concept of a conservative force.
5. Explain concepts of power and mechanical efficiency.
6. Apply particle dynamics
7. Ability to make a right decision related to a choice of the system of particles whose motion is to be studied.
8. Ability to correctly draw the free-body diagram (FBD) for the system.
9. Ability to write and solve Newton equations of motion for the system.
10. Ability to use principles derived from Newton’s second law, including Work & Energy, and Momentum.
11. Apply the kinematics of two-dimensional (planar) rigid-body motion.
12. Ability to use concepts of angular displacement, angular velocity and angular acceleration.
13. Ability to draw a FBD for a system of rigid bodies.
14. Ability to determine mass moment of inertia for body.
15. Ability to use principles derived from Newton’s second law, including Work & Energy, and Momentum, to derive equations of motion for a general rigid-body planar motion.
16. Ability to use SEI of units in all mechanical quantities (linear and angular displacement, velocity and acceleration, mass, force, torque, work/energy, power, momentum, mass moment of inertia).</td></tr>
<tr><td rowspan="5">Course content broken down in detail by weekly class schedule (syllabus)</td><td colspan="4">Course content</td><td>L or S hours</td><td>AE hours</td></tr>
<tr><td colspan="4">Kinematics of Rectilinear motion.</td><td>2</td><td>2</td></tr>
<tr><td colspan="4">Kinematics of Curvilinear motion.</td><td>2</td><td>2</td></tr>
<tr><td colspan="4">Bounded motion of particle, 2. Newton law.</td><td>2</td><td>2</td></tr>
<tr><td colspan="4">Principle of kinetic energy.</td><td>2</td><td>2</td></tr>
</table>

	Work –energy theorem.	2	2
	Principles of linear and angular momentum.	2	2
	Kinematics of Relative motion of particle, Coriolis acceleration.	2	2
	A non-inertial reference frame.	2	2
	Dynamics of a system of particles	2	2
	Planar kinematics of body.	2	2
	Body inertia.	2	2
	Planar kinetics of body.	2	2
	Planar kinetics of bodies.	2	2
	Work and energy of body. Conservation laws.	2	2
	Principles of linear and angular momentum of body. Impact of bodies.	2	2
	Kinetics of body in (3D) space (Euler equations). Gyroscopic motion.	2	2
	Introduction in analytical mechanics. Hamilton principle	1	1
	Lagrangian equations.	2	2
	Free vibration. Natural frequency.	2	2
	Forced vibration. Resonance.	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	Research		Practical training	
	Experimental work		Report		Individual work	4
	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. The midterm and final exams are carried out as written tests. The requirement for passing grade is 50 % points on each midterm exam or the final exam. Grade (in percentage) is formed according to the formula: Grade(%) = 0,5 (M1 + M2) • M1, M2 – test results.

Required literature (available in the library and via other media)	**Title**	**Number of copies in the library**	**Availability via other media**
	Ž. Lozina: Lectures, FESB		Elearning portal
	Ž. Lozina: Kinematika, Sveučilište u Splitu		
	Ž. Lozina: Dinamika, Sveučilište u Splitu		

Optional literature (at the time of submission of study programme proposal)	Gross, D., Hauger, W., Schröder, J., Wall, W.A., Bonet, J.: Engineering mechanics 3, Springer, 2011.		
Quality assurance methods that ensure the acquisition of exit competences	- Evaluation of results in accordance with the above learning outcomes - Feedback from students via surveys - Self-evaluation of teachers - Institutional and non-institutional evaluations		
Other (as the proposer wishes to add)			

NAME OF THE COURSE	ENGLISH LANGUAGE 1							
Code	FEOR02	Year of study	1					
Course teacher	Mira Braović Plavša, Senior Lecturer	Credits (ECTS)	2					
Associate teachers	-	Type of instruction (number of hours)	L	S	AE	LE	DE	
			0	30	0	0	0	
Status of the course	Mandatory	Percentage of application of e-learning	0					

COURSE DESCRIPTION

Course objectives	Training students for: - understanding and application of technical vocabulary concerning mechanical engineering - development of students' oral and written communication skills in English - improving general English language knowledge		
Course enrolment requirements and entry competences required for the course	None		
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	Students will be able to: 1. Explain basic notions of technical sciences and their branches as well as differences between theoretical and applied sciences 2. Count and explain mechanical and physical properties of materials 3. Comment on differences between engineering materials and their uses 4. Correctly read numbers, units, equations and other mathematical expressions used in engineering 5. Translate independently less complicated professional texts and interpret tables, diagrams and charts 6. Use relevant grammar structures (passive, reduced relative clauses, cause and effect clauses, irregular plurals, MLU-s) 7. Use phrasal expressions to improve English language knowledge		
Course content broken down in detail by weekly class schedule (syllabus)	Course content	S hours	AE hours
	Introduction to the course, U 1 - Engineering profession	2	
	Study section 1 – passive voice	2	
	U 2 – Engineering mechanics	2	
	Study section 2 – reduced relative clauses	2	
	U 3 – Numbers and mathematics	2	
	Study section 3 – mathematical expressions in engineering	2	
	U 4 - Mathematics	2	
	First midterm exam		
	U 5 – mechanical properties of metals	2	
	Study section 5 – compound nouns	2	
	Language study – dealing with technical terms; speaking practice	2	
	U 6 – Stress and strain	2	
	Study section 6 –irregular plurals	2	
	Practice for the midterm exame	2	
	Second midterm exam		
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 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		Research		Practical training	
	Experimental work		Report		Individual work	0,5
	Essay		Seminar essay		(Other)	
	Tests	1,5	Oral exam		(Other)	
	Written exam		Project		(Other)	

Grading and evaluating student work in class and at the final exam	There are two midterms and a final exam. The first midterm exam is after 7 weeks of lecturing and the second one is after the next 6 weeks. Students who do not pass both midterm exams have to take the final exam containing learning materials from both midterm exams. 50 % of the test should be solved to have a passing grade. The grade is formed according to the score: 15 % of best solved tests - excellent (5) 35 % of second best solved test - very good (4) 35 % next solved tests - good (3) 15 % of lowest passing tests- sufficient (2). Students who pass the final test in the third term can get only sufficient grade (2). Midterm and final exams are carried out according to the academic year calendar.

Required literature (available in the library and via other media)	**Title**	**Number of copies in the library**	**Availability via other media**
	Pilković, Mara (1987). English for Students of Mechanical Engineering. Split, FESB.		
	Morgan, David; Regan, Nicholas (2008). Take-Off. Technical English for Engineering. Reading: Garnet Education.		
	Cunningham, Sarah; Peter Moor (2000). Cutting Edge. Longman		

Optional literature (at the time of submission of study programme proposal)	Newby, David. (1996). Grammar for Communication. Zagreb: Školska knjiga. Glendinng, Eric H.; Glendinning, Norman (2001). Oxford English for Electrical and Mechanical Engineering. Oxford: Oxford University Press.

	Master, Peter (2004). English Grammar and Technical Writing. Washington: US Department of State, Office of English Language Programs. Mc Carthy, Michael; O'Dell, Felicity. (2008). Academic Vocabulary in Use. Cambridge: Cambridge University Press.
Quality assurance methods that ensure the acquisition of exit competences	Evaluation of results in accordance with the above learning outcomes Feedback from students via surveys Self-evaluation of teachers
Other (as the proposer wishes to add)	

NAME OF THE COURSE	ENGLISH LANGUAGE 2							
Code	FEOR04	Year of study	1					
Course teacher	Mira Braović Plavša Senior Lecturer	Credits (ECTS)	2					
Associate teachers	-	Type of instruction (number of hours)	L	S	AE	LE	DE	
			0	30	0	0	0	
Status of the course	Mandatory	Percentage of application of e-learning	0					

COURSE DESCRIPTION

Course objectives	Training students for: - understanding and application of technical vocabulary concerning mechanical engineering - development of students' oral and written communication skills in English - improving general English language knowledge
Course enrolment requirements and entry competences required for the course	None
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	Students will be able to: 1. Count types of beams and explain their usage in constructions 2. Describe mechanical and physical properties of materials 3. Count and describe various types of welding 4. Translate independently less complicated professional texts and interpret tables, diagrams and charts 5. Use relevant grammar structures (passive, reduced relative clauses, cause and effect clauses, irregular plurals, MLU-s) 6. Use phrasal expressions to improve English language knowledge

Course content broken down in detail by weekly class schedule (syllabus)	Course content	S hours	AE hours
	Revision of the first term vocabulary and grammar	2	
	Unit 7 Design stress and a factor of safety	2	
	Study section 7- modifiers	2	
	U 8 - Beams	2	
	Study section 8 – relation between two variables	2	
	U 9 – Iron Study section 9 – expressions of purpose	2	
	First midterm exam		
	U 10 – Steels	2	
	Study section 10 – results and consequences	2	
	U 11 - Welding	2	
	Study section 11 – instructions, advice, descriptions and reports	2	
	U 12 – Aluminium	2	
	Study section 12 – conditionals	2	
	Practice for the midterm exame	2	
	Second midterm exam		

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

<table>
<tr><td></td><td colspan="6">☐ field work</td><td></td></tr>
<tr><td>Student responsibilities</td><td colspan="7">The presence on lectures in the amount of at least 70 % of the times scheduled.
Performed all required exercises.</td></tr>
<tr><td rowspan="5">Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)</td><td>Class attendance</td><td></td><td>Research</td><td></td><td>Practical training</td><td></td></tr>
<tr><td>Experimental work</td><td></td><td>Report</td><td></td><td>Individual work</td><td>0,5</td></tr>
<tr><td>Essay</td><td></td><td>Seminar essay</td><td></td><td>(Other)</td><td></td></tr>
<tr><td>Tests</td><td>1,5</td><td>Oral exam</td><td></td><td>(Other)</td><td></td></tr>
<tr><td>Written exam</td><td></td><td>Project</td><td></td><td>(Other)</td><td></td></tr>
<tr><td>Grading and evaluating student work in class and at the final exam</td><td colspan="7">There are two midterms and a final exam. The first midterm exam is after 7 weeks of lecturing and the second one is after the next 6 weeks. Students who do not pass both midterm exams have to take the final exam containing learning materials from both midterm exams. 50 % of the test should be solved to have a passing grade. The grade is formed according to the score:

15 % of best solved tests - excellent (5)

30 % of second best solved test - very good (4)

30 % next solved tests - good (3)

15 % of lowest passing tests- sufficient (2).

Students who pass the final test in the third term can get only sufficient grade (2).
Midterm and final exams are carried out according to the academic year calendar.</td></tr>
<tr><td rowspan="3">Required literature (available in the library and via other media)</td><td colspan="4">Title</td><td>Number of copies in the library</td><td>Availability via other media</td></tr>
<tr><td colspan="4">Pilković, Mara (1987). English for Students of Mechanical Engineering. Split: FESB.</td><td></td><td></td></tr>
<tr><td colspan="4">Morgan, David; Regan, Nicholas (2008). Take-Off. Technical English for Engineering. Reading: Garnet Education.</td><td></td><td></td></tr>
<tr><td>Optional literature (at the time of submission of study programme proposal)</td><td colspan="7">Newby, David. (1996). Grammar for Communication. Zagreb: Školska knjiga.

Glendinng, Eric H.; Glendinning, Norman (2001). Oxford English for Electrical and Mechanical Engineering. Oxford: Oxford University Press.

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

Mc Carthy, Michael; O'Dell, Felicity. (2008). Academic Vocabulary in Use. Cambridge: Cambridge University Press.</td></tr>
<tr><td>Quality assurance methods that ensure the acquisition of exit competences</td><td colspan="7">Evaluation of results in accordance with the above learning outcomes
Feedback from students via surveys
Self-evaluation of teachers</td></tr>
</table>

Other (as the proposer wishes to add)	

NAME OF THE COURSE	FINAL THESIS						
Code	FEYY01	Year of study	3				
Course teacher		Credits (ECTS)	10				
Associate teachers		Type of instruction (number of hours)	L	S	AE	LE	DE
Status of the course	Mandatory	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 • being independent in solving problems under the given conditions • writing and presenting the project results
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: 1. consolidate theoretical knowledge and practical skills in solving problems 2. use literature, databases and other sources of information 3. select appropriate methods and procedures for solving practical problems 4. apply technical knowledge and skills to effectively solve engineering problems 5. give public presentation, to prepare written report and present project results
Course content broken down in detail by weekly class schedule (syllabus)	Final thesis is the independent work of the student produced according to the task and instructions given by the supervisor
Format of instruction	☐ 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	
	Experimental work		Report		Individual work	10
	Essay		Seminar essay		(Other)	
	Tests		Oral exam		(Other)	
	Written exam		Project		(Other)	

Grading and evaluating student work in class and at the final exam	Final thesis is evaluated by the supervisor based on the student's achievements during the process of the final thesis production and on written and oral presentation.

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

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

NAME OF THE COURSE	FLUID MECHANICS						
Code	FESR21	Year of study	2.				
Course teacher	Branko Klarin, Ph. D., Full Professor	Credits (ECTS)	5				
Associate teachers	Maja Zore, 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	Training students for: • understanding and application of basic principles and laws of fluid mechanics, • recognition of problem nature and selection of proper relations for their solving, • selecting analysis methods and solving simple problems.		
Course enrolment requirements and entry competences required for the course	Mathematics		
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	Students will be able to: 1. define the fundamental fluid phenomena, inner and outer forces and stresses in fluids, 1. recognize and solve forces on general surfaces, 2. recognize conditions and quote parameters of relative stillness and solve problems, 3. apply Euler equations of fluid statics, Bernoulli equation, momentum equation and continuity, 4. explain boundary layer formation, 5. calculate flow losses in pipes, 6. recognize hydro- and aerodynamic forces on bodies, 7. choose and apply similarity criteria.		
Course content broken down in detail by weekly class schedule (syllabus)	Course content	L or S hours	AE hours
	Introduction to fluid mechanics. Fluid properties. Lagrange and Euler coordinat system.	2	1
	Apecific pressure in different directions. Euler equilibrium conditions. Fluid in gravity field.	2	1
	Forces on flat and curved surfaces. Basics of floating and stability.	2	1
	Relative stillness – translation and rotation.	2	1
	Dynamics of ideal fluid – Euler variables. Streamlines and flow field. The equation of continuity. Bernoulli 's equation. Venturi 's tube.	2	1
	Leakage from container and underwater leakage. The occurrence of cavitation.	2	1
	The momentum equation.	2	1
	Real fluid dynamics - flow of viscous liquids. Stresses in the fluid.	2	1
	Laminar and turbulent flow. The term of the boundary layer.	2	1
	Opposing body - friction and resistance form. Hydro- and airfoils. Wings and flow channel.	2	1
	The tube flow resistance and losses. Nikuradze's experiments and Moody's diagram. Liquid flow in pipes of various diameters and under pressure.	2	1
	The concept of dimensional analysis and similarity flow.	2	1

	Criteria similarity: Newton's, Frude's, Reynolds's, Euler's and Mach's number.		
	Introduction to the working principle and elements of turbomachinery.	2	1
	List of laboratory or design exercises		LE or DE hours
	Properties of fluids		0,5
	Leaking		0,5
	Calculation of hydrodynamic boundary layer		1
	Air flow measurements		1
	Demonstration (fieldwork) - wind power, hydroelectric power plants		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	3,5	Research		Practical training	
	Experimental work		Report		Individual work	
	Essay		Seminar essay		Laboratory exercises	0,5
	Tests	1	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 three numerical problems and five theoretical questions. In the final exams students that did not pass the midterm exams take part. The final exams are carried out as written tests, both numerical and theoretical questions. The requirement for passing grade is the positive grade of numerical (obligatory) and theoretical grade. Grade (in percentage) is formed according to the formula: Grade(%) = 0,5 (M1 + M2) where in percentage: • M1, M2 – test results.

Required literature (available in the library and via other media)	**Title**	**Number of copies in the library**	**Availability via other media**
	B. Klarin: Mehanika fluida, autorizirana predavanja, FESB		e-learning portal
	Lj. Pilić-Rabadan, Mehanika fluida, FESB Split, 1992.	10	
	M. Pečornik, Tehnička mehanika fluida, Sveučilište u Rijeci, Rijeka, 1985.	10	

Optional literature (at the time of submission of study	- Kuethe, A.M.; Chow, C-Y.: Foundations of Aerodynamics, Wiley, 1986. - Fox, R.W.; McDonald, A.T. Introducing to Fluid Mechanics, Wiley, 1994.

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

NAME OF THE COURSE	HEATING AND AIR CONDITIONING						
Code	FESR10	Year of study	3				
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	Obligatory.	Percentage of application of e-learning					

COURSE DESCRIPTION

Course objectives	Training students for: • Categorization and description of the HVAC systems, • Compute and general design of the elements inside the HVAC systems according to standards.		
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: 1. Consider base terms and issues related to the thermal comfort, 2. Analyse and compute heat losses and gains according to the standards, 3. Compare fuels in the HVAC systems, i.e. heating and cooling applications and elaborate their impact to the environment, 4. Consider and compute base components of the heating/cooling, i.e. HVAC systems, 5. Consider and compute ventilation systems.		
Course content broken down in detail by weekly class schedule (syllabus)	Course content	L or S hours	AE hours
	Introduction and basic terms (issues) related to the thermal comfort. External and internal design temperatures. Climate conditions.	2	2
	Calculation of the heat losses.	2	2
	Calculation of the heat losses.	2	2
	Heating elements, characteristics, correction of the nominal thermal load.	2	2
	Central heating systems, calculation of the carbon dioxide emissions.	2	2
	Calculation and design of the pipelines in the heating systems.	2	2
	Boilers, types, classification, boiler rooms.	2	2
	Other equipment of the heating systems.	2	2
	Preparation of the hot water and calculation of the heating	2	2

	demands.		
	Regulation of the heating systems.	2	2
	Calculation of the heat gain.	2	2
	Fan coil devices, other cooling elements.	2	2
	Central water based air-conditioning systems, climate chambers, coolants (refrigerants)	2	2
	Ventilation systems, components, calculation of the required airflow for ventilation purpose.	2	2
	Heat pumps, absorption cooling devices.	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 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 Grijanje i Klimatizacija dio I i dio II, 2011, FESB.		
	Recknagel, Sprenger, Schramek, Čeperković: Grijanje i klimatizacija 2005, Energetika marketing, Zagreb, 2005 (Prijevod sa njemačkog)		

	ASHRAE Handbooks: Fundamentals, Applications, Systems and Equipment, Refrigeration, ASHRAE, Atlanta, USA, 2001, 2002, 2003, 2004		
	Priručnik za Ventilaciju I klimatizaciju, EGE, 2003.		
	Priručnik za grijanje, EGE, 2005		
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	HYDRAULICS AND PNEUMATICS						
Code	FETR05	Year of study	2				
Course teacher	Jani Barle	Credits (ECTS)	5				
Associate teachers	Alen Kovač	Type of instruction (number of hours)	L	S	AE	LE	CE
			30	0	15	15	0
Status of the course	Obligatory	Percentage of application of e-learning	0				

COURSE DESCRIPTION

Course objectives	To develop ability to: - Illustrate essential features of a basic hydraulic or pneumatic system. - Identify elements by symbol and function. - Draw and explain basic hydraulic or pneumatic schematic diagram.
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. Combine various elements with respect to size and design concept. 4. Interpret simple hydraulics and pneumatics systems. 5. Determine faults and failure causes.

Course content broken down in detail by weekly class schedule (syllabus)	Course content	L hours	LE hours	AE hours
	Introduction to pneumatics. Basic physical principles of pneumatics.	2		
	Typical pneumatic systems demonstrations.		2	
	Standards and Symbols. Compressed air generation and distribution.	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	
	Special pneumatic elements: - valve combinations. Electric valves and electropneumatic systems.	2		
	Circuit assembling on pneumatic didactic table.		2	
	Introduction to hydraulics. Basic physical principles of hydraulics. Fundamental hydraulic problems: cleanness, temperature, cavitation.	2		
	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.	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:

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

- *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	**Title**	**Number of copies in the library**	**Availability via other media**

media)	Barle, J.: Hydraulics and pneumatics, (student handbook and workbook in Croatian: *Hidraulika i pneumatika*), FESB, Split, 2010.		e-learning portal
	Nikolić, G.: Pneumatika, Školske novine, Zagreb, 1994.		
Optional literature (at the time of submission of study programme proposal)	Koroman, V.; Mirković, R.: Hidraulika i pneumatika, Školska knjiga, Zagreb, 1991. Lang, R.A. (ed.): Hydraulic Trainer 1; Planning and Design of Hydraulic Power Systems, Mannesmann Rexroth AG, 1998. Rabie, M.: Fluid Power Engineering, McGraw-Hill, 2009.		
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	INDUSTRY PROCESSES AUTOMATIC CONTROL							
Code	FETR13	Year of study	3					
Course teacher	Jadranka Marasović Jani Barle	Credits (ECTS)	5					
Associate teachers	Ivan Jadrić	Type of instruction (number of hours)	L	S	AE	LE	CE	
			30	0	0	30	0	
Status of the course	Obligatory	Percentage of application of e-learning	0					

COURSE DESCRIPTION

Course objectives	Upon completion, the student should be able to demonstrate basic knowledge about industrial process control problems, theoretical and practical principles as well as the importance of processes dynamic characteristics and application of automatic sequential control systems. Students will be able to transfer acquired skills and attitudes to a work in different fields (technical systems, chemical processes, in economy, medicine etc.). Students will 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 the principles of systems analysis and synthesis in the time and frequency domains. 3. Create and apply mathematical models of different systems and to understand their importance for the automated processes design. 4. Infer the transfer functions of the first and second order systems. 5. Choose the appropriate methods for the synthesis and taking account of the tasks and possibilities of physical performance. 6. Identify system stability and to solve independently complex tasks of system automation. 7. Present and to explain the use of simple mechanical regulators.		
Course content broken down in detail by weekly class schedule (syllabus)	Course content	L hours	LE hours
	Introduction: automation tasks, problems and practical use. System theory. Control theory. Control loop. Systems modeling and simulation	2	
	Mathematical models and analysis in time domain. Step function as standard input function. System time domain response.	2	
	How to translate mathematical models in software language MATLAB?		3
	Standard input functions. Time domain system response. Transient function.	2	
	Simulation of linear differential equations in MATLAB, using Toolbox Simulink.		3
	Dynamical analogies (mechanical, hydraulic, thermal, electrical). Model linearization.	2	
	Integral convolution. Laplace transform. Transfer function.	2	
	Transfer function: simulation and analysis.		3

	Transfer function for simple and complex systems. Blocks algebra.	2	
	The complex systems analysis using transfer functions and blocks algebra.		3
	Complex system analysis. Steady state and transient response of the first and second-order systems.	2	
	The analysis of the first order system. The parts of the systems response in time domain: transient part and steady state part.		3
	Stability and performance of feedback control systems. Means for regulator response time improvement.	2	
	The analysis of the second order system. The parts of the systems response in time domain: transient part and steady state part.		3
	Analysis in the frequency domain. Frequency response and the graphic presentation (Bode). The frequency characteristics of basic and complex systems.	2	
	Analysis in the frequency domain. Frequency response and the graphic presentation (Bode).		3
	Control systems structure. Principles and classification of sensing elements.	2	
	Control systems structure. Principles and classification of actuators.	2	
	Systems stability. Control system synthesis. P and PID regulator.		3
	Servomechanism. Proportional and servo valves.	2	
	General functional arrangement of the control system.	2	
	Sequential switching control system simulation. Physical implementations -PLC.		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	0,4	Lab exercises	0,4
	Tests	0,2	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 mid-term exams (tests). The first mid-term will be held during class (according to the calendar), and the other colloquium after the end of classes. Individual colloquium will be considered passed if it achieved 40% correct answers or total points achieved that give a positive evaluation must be at least 50% correct. It is necessary during the semester to resolve homework and seminars to be recognized (enrolled) score achieved by tests and exams. The final grade is determined based on the total number of points earned, which is calculated as follows (Including laboratory exercises points, M3) Grade [%] = 0.45 * M1 + 0.45*M2 + 0,1*M3 Percentage — Grade 50% to 61% — sufficient (2) 62% to 74% — good (3)

<table>
<tr><td></td><td colspan="3">75% to 87% very good (4)
88% to 100% excellent (5)
The final exam encompasses the entire course load or selected parts of it that students' did not pass at either of mid-term exams. The correction exam encompasses the entire course load. The requirement for passing the exam is minimum of 50 percent correct answers. The exams are held according to the class schedule.</td></tr>
<tr><td rowspan="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>J. Marasović; "Basics Steps of Automatic Control“ (in Croatian: Temeljni postupci u automatici), FESB, Authorized lectures</td><td></td><td>e-learning portal</td></tr>
<tr><td>J Božičević J.: "Basics of Automatic Control 1“ (in Croatian: Temelji automatike 1), Školska knjiga, Zagreb, 1990</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">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.</td></tr>
<tr><td>Quality assurance methods that ensure the acquisition of exit competences</td><td colspan="3">- Keeping records on class attendance
- Annual analysis of exam results
- Student survey on teaching performance
- Teacher self-evaluation
- Feedback information from graduates regarding course content relevancy</td></tr>
<tr><td>Other (as the proposer wishes to add)</td><td colspan="3"></td></tr>
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NAME OF THE COURSE	INTRODUCTION TO COMPUTER APPLICATIONS						
Code	FESY01	Year of study	1.				
Course teacher	Goran Petrović, Ph.D., Associate Professor	Credits (ECTS)	5				
Associate teachers	Josip Vasilj, Ph. D., 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	50				

COURSE DESCRIPTION

Course objectives	Training students for: • using internet, e-learning, and protection from malicious software. • using computers as office tool • using computers as engineer's tool		
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. Identify and discuss the main functions of computer: IO, processing, storage. 2. Identify and discuss main hardware parts of personal computer. 3. Describe the operating system functions and some OS services. 4. Use office application for word processing, 5. Use office application for spreadsheet and presentation, 6. Identify and discuss some engineer's tools.		
Course content broken down in detail by weekly class schedule (syllabus)	Course content	L hours	AE hours
	History of computers. Computer architecture. Central processing unit.	2	0
	Representing information as bit patterns. Arithmetic/Logic Instructions. Machine language. Simple program execution.	2	0
	The History of Operating Systems. File management. Components of an Operating System.	2	0
	Network fundamentals. Network classifications. Protocols. The World Wide Web. Malicious software removal tools.	2	0
	Office tools: Word processing. MS Word environment. Editing. Formatting. Printing.	2	0
	Office tools: Symbols. Tabulators. Tables. Inserting object. Equations. Figures. Drawings. Headers and footers.	2	0
	Office tools: Styles. Templates. Spell check. Bookmarks. Circular letters. Table of content.	2	0
	First midterm exam		
	Office tools: Spreadsheets. MS Excel environment. Editing. Formatting. Printing.	2	0
	Office tools: Sorting and filtering. Forms. References and functions. Graphs. Pivot table.	2	0
	Office tools: Presentations. MS Power Point environment. Smart Art. MS Visio environment. Drawing.	2	0
	Engineers tools: Introduction to LabVIEW environment. Data types. Simple LabVIEW application for acquire analyze and present data. Using Loops and Decision-Making Structures.	2	0
	Engineers tools: Shift registers. Vectors, Arrays, Matrices. Modular programming in LabVIEW. Implementing File I/O functions. Automatic report generation.	2	0

	Hardware: Processor. Random Access Memory Mass storage: Magnetic systems, Optical systems, Flash drives. Buses. IO channels. Monitors. Scanners. Printers.	2	0
	Second midterm exam		
	List of laboratory exercises		LE hours
	Internet: www, E-mail. E- learning. Windows explorer. Accessories.		3
	MS Word: Editing. Formatting. Page setup. Printing.		3
	MS Word: Symbols. Tabulators. Tables. Inserting object. Equations. Figures. Drawings. Headers and footers.		3
	MS Word: Styles. Templates. Spell check. Bookmarks. Circular letters. Table of content.		3
	MS Excel: Environment. Editing. Formatting. Printing.		3
	MS Excel: Sorting and filtering. Forms. References and functions. Graphs. Pivot table.		3
	MS Power Point: Environment. Smart Art. MS Visio environment.		3
	Introduction to LabVIEW environment. Data types. Using Loops, Structures. Automatic report generation.		3
	Practical skills exam		2

Format of instruction	☒ lectures ☐ seminars and workshops ☒ exercises ☐ *on line* in entirety ☐ partial e-learning ☐ field work	☐ independent assignments ☒ multimedia ☒ laboratory ☐ work with mentor ☐ (other)
Student responsibilities	The presence on lectures in the amount of at least 70 % of the times scheduled. Performed all required laboratory exercises.	

Screening student work *(name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)*						
	Class attendance	1	Research		Practical training	
	Experimental work		Report		Individual work	3
	Essay		Seminar essay		Laboratory exercises	0,5
	Tests	0,5	Oral exam		Preparation for laboratory exercises	0,5
	Written exam	0,5	Project		(Other)	

Grading and evaluating student work in class and at the final exam	There are two midterms and final exams that are carried out as written tests. The first midterm exam is after 7 weeks of lecturing and the second one is after the next 6 weeks. Each midterm test consists of 30 short theoretical questions and final tests consist of 30 short theoretical questions. In the final exams students that did not pass the midterm exams take part. The requirement for passing grade is the positive assessment of laboratory exercises and 40 % points on each midterm exam or the final exam. Grade (in percentage) is formed according to the formula: Grade(%) = 0,4 LV + 0,3 (M1 + M2) the activities in percentage: • LV – laboratory assessment, • M1, M2 – test results.

Required literature (available in the library and via other media)	**Title**	**Number of copies in the library**	**Availability via other media**
	G. Petrović: Skripta s predavanja, FESB		e-learning portal
Optional literature (at the time of	J. Glenn Brookshear: Computer science an overview, Addison-Wesley. 2012. A. Mamishev. M. Sargent, Creating Research and Scientific Documents Using		

submission of study programme proposal)	Microsoft Word, Microsoft Press, 2013. LabVIEW Basics I Introduction Course Manual
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	INTRODUCTION TO ENTREPRENEURSHIP						
Code	FESY03	Year of study	2				
Course teacher	Marija Šiško Kuliš, Ph. D., Associate Professor	Credits (ECTS)	3				
Associate teachers		Type of instruction (number of hours)	L	S	AE	LE	DE
			30	0	15	0	0
Status of the course		Percentage of application of e-learning					

COURSE DESCRIPTION

Course objectives	Students introduce into the entrepreneurship world which is the process of creating value where the businessman at the one place collects all the resources needed for the realization of business opportunities by acapting the risk of losing money, time or some form goods or service. All students who can submit the challenges of decision-making can learn how to become an entrepreneur and how to to behave entrepreneurially
Course enrolment requirements and entry competences required for the course	No.
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	Students will be able to: 1. To define corectly the terms entrepreneur and entrepreneurship through the thought, content and conceptual basis. 2. To assess and analyze the entrepreneurial activity in the context of economic and engineering dimensions. 3. The strengths and weaknesses accession to the entrepreneurship. 4. To collect and interpret data in the field of market analysis (competition, distributors, partners) and make conclusions regarding issues of entrepreneurial activity. 5. To understand the basic elements of the entrepreneurial accounting and analysis of financial reports. 6. To develop a business plan in the field of engineering entrepreneurship with all necessary, technological, economic and financial parameters. 7. To present their own business plan clearly and unequivocally that will support the feasibility of entrepreneurial investment.

Course content broken down in detail by weekly class schedule (syllabus)	Course content	L or S hours	AE hours
	1. Introduction - The concept of enterprise and entrepreneurship	2	1
	2. Business idea, brainstorming and focus groups	2	1
	3. Business Plan Part 1	2	1
	4. Business Plan Part 2	2	1
	5. Marketing	2	1
	6. Market Analysis	2	1
	7. Fixed and current assets	2	1
	8. Amortization	2	1
	9. Cost benefit analysis	2	1
	10. Entrepreneurial infrastructure	2	1
	11. Entrepreneurial incubators	2	1
	12. The kinds of entrepreneurship	2	1
	13. Company establishment	2	1
	14. Franchise	2	1

	15. Practice examples and presentation of business plans	2	1
	List of laboratory or design exercises		LE or DE hours

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

Screening student work *(name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)*	Class attendance	0.5	Research		Practical training	
	Experimental work		Report		(Other)	
	Essay		Seminar essay		(Other)	
	Tests	1	Oral exam	0.5	(Other)	
	Written exam		Project	1	(Other)	

Grading and evaluating student work in class and at the final exam	During the semester there will be two mid-term exams (tests). The first is the pre-exam after 7 weeks of classes, the second after the next 6 weeks. On the final exam students take the parts of the material that did not pass on the mid-term. Each midterm carried out as written exam for a period of 75 minutes and consists of 20 odd questions and is based on the business plan which students independently write. The requirement for a positive evaluation is a positive evaluation of the self-made business plan, and the final grade (in percentages) formed according to the formula: Rating (%) = 0.05 + 0.15 NA 0.4 PP + (M1 + M2) where activities are expressed in percentages: • NP - attendance at lectures, • PP - Feedback from the business plan, • M1, M2 - POINTS midterm. . The final grade is determined after the second final exam, applying the relative ECTS grading system in accordance with the Regulations on Study and Study System, University of Split. A group of students who passed the exam is divided into four sub-groups: 15% of the best students are graded excellent, 35% following very good, the next 35% are graded good and the last 15% of the assessment is sufficient. Students who did not pass the exam after two final exam take a makeup exam in autumn period in which they can get a positive grade. At the Correctional exam graded the overall material. The exam is written with 20 questions and tasks and lasts 90 minutes.

Required literature (available in the library and via other media)	**Title**	**Number of copies in the library**	**Availability via other media**
	M. Šiško Kuliš: Autorizirana predavanja, FESB		https://elearning.fesb.unist.hr

	M. Šiško Kuliš: Autorizirana radna bilježnica		https://elearning.fesb.unist.hr
	Kirby, D., A.: Entrepreneurship, McGraw Hill, London, 2003.	0	https://www.amazon.co.uk/Entrepreneurship-David-Kirby/dp/0077098587
	Kolaković, M.: Poduzetništvo u ekonomiji znanja, Sinergija, Zagreb, 2006.	0	http://www.superknjizara.hr/?page=knjiga&id_knjiga=17388
Optional literature (at the time of submission of study programme proposal)	- Longenecker, J. G.; Moore, C. W.: Small Business Management – An Entrepreneurial Emphasis, Thomson South-Western, 2003		
Quality assurance methods that ensure the acquisition of exit competences	- registering the class attendance - annual analysis of the performance of the examination - student survey in order to evaluate teachers - self-evaluation of teachers - feedback from students who have already graduated the relevance of content course		
Other (as the proposer wishes to add)			

NAME OF THE COURSE	MACHINE ELEMENTS 1							
Code	FESR14	Year of study	2					
Course teacher	Podrug, Ph.D., Full Professor Srdjan	Credits (ECTS)	5					
Associate teachers	Full Professor Damir Jelaska, Ph. D. mr. sc. Milan Perkušić, assistant Filip Grubišić-Čabo, assistant	Type of instruction (number of hours)	L	S	AE	LE	DE	
			30				30	
Status of the course	Obligatory	Percentage of application of e-learning	0					

COURSE DESCRIPTION

Course objectives	Training students for: • understanding of machine elements operation principles and designing basis.	
Course enrolment requirements and entry competences required for the course	Engineering graphics 1 and Engineering graphics 2.	
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	Students will be able to: 1. Identify the loads imposed on the machine elements. 2. Evaluate and apply the necessary safety factor. 3. Explain the advantages and disadvantages of certain machine elements 4. Select machine elements based on the criteria. 5. Design and calculate fasteners, springs, shafts and bearings.	
Course content broken down in detail by weekly class schedule (syllabus)	Course content	L hours
Course content broken down in detail by weekly class schedule (syllabus)	Conception and classification of machine elements. Load, stress and strain. Safety factor and allowable stress.	2
	Static strength. Fatigue strength. S-N (Wohler) diagram. Fatigue (Smith) diagram.	2
	Safety factor and dynamic strength of machine elements. Strength in the case of variable amplitude stresses.	2
	Welded joints: conception, procedures, types, labeling, quality, design, calculation.	2
	Threaded fasteners: conception and classification. Standard thread forms, materials.	1
	Design of the threaded fasteners: bolts, nuts, washers, Locking mechanisms. Forces and torque acting in bolted joints.	2
	Strength calculation of the threaded fasteners: preloaded bolts, transversely loaded bolts, power screws.	2
	Pin bolts and dowel pins. Keys and feather keys: type, strength calculation; Spline shaft connections.	2
	Cylindrical press connections: calculation. Tapered press connections: calculation	2
	Springs: classification, stiffness and work, calculation of the helical compression and extension springs, leaf springs, belleville springs and rubber springs.	2

	Shafts: conception, materials, design, dimensioning, strength calculation, deformation, critical speed.	2
	Bearings. Types and classification. Comparison of sliding and rolling bearings. Friction and lubrication. The theory of hydrodynamic lubrication. Journal slider bearings. Sommerfeld number.	2
	Thrust slider bearings.	1
	Roller bearings. Types and labels. Dynamic load rating and calculation of roller bearings. Static load rating.	2
	List of design exercises	DE hours
	Design of the car jack	13
	Design of the tapered shaft connection and of the welded joint	13

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	Course attendance and activity (lectures, exercises), machine elements design, studying.	

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	During the semester, there will be two mid-term exams (tests). The first mid-term, after 7 weeks of classes, and the second after 13 weeks of classes. In the final exams students that did not pass the midterm exams take part. Grade (%) = 0,3K + 0,35(M1 + M2) K - rating from design exercises expressed in percentage, M1, M2 - points of first mid-term exams expressed in percentage, mid-term exams consist of theoretical questions. The requirement for a positive evaluation is the positive assessment of design exercises K >= 45%, the first mid-term M1 >= 45%, and the second mid-term M2 >= 45%. The final grade is determined as follows: Percentage - Rating 50% to 61% - Sufficient (2) 62% to 74% - Good (3) 75% to 87% - Very good (4) 88% 100% - Excellent (5) Students who do not get positive evaluation through mid-term exams take written numerical and theoretical exam.

Required literature (available in the library and via other media)	**Title**	**Number of copies in the library**	**Availability via other media**
	Podrug, S.: Machine Elements – course materials (in Croatian)		e-learning portal
	Jelaska, D: Machine Elements, I part, University of Split, 2007. (in Croatian)	10	

	Jelaska, D., Piršić, T., Podrug, S.: Car Jack Design (Directions), FESB, Split 2002. (in Croatian)		e-learning portal
	Jelaska, D., Podrug, S: Design of the Tapered Press Connection and of the Welded Joint (Directions), FESB, Split 2003. (in Croatian)		e-learning portal
Optional literature (at the time of submission of study programme proposal)	- Križan, B.: Fundamentals of Calculation and Design of Machine Elements, Školska knjiga, Zagreb, 2008. (in Croatian) - Decker, K.H.: Machine Elements, Tehnička knjiga, Zagreb, 2006. (in Croatian)		
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 ELEMENTS 2							
Code	FESR15	Year of study	2					
Course teacher	Srdjan Podrug, Ph.D. Associate Professor	Credits (ECTS)	7					
Associate teachers	Damir Jelaska, Ph. D. Full Professor, Milan Perkušić, Teaching assistant	Type of instruction (number of hours)	L	S	AE	LE	DE	
			30	0	0	0	45	
Status of the course	Obligatory	Percentage of application of e-learning	0					

COURSE DESCRIPTION		
Course objectives	Basic knowledge of power transmissions with gears as well as their design and calculation. Mastering the problems of design and calculation of the couplings and clutches.	
Course enrolment requirements and entry competences required for the course	Engineering graphics 1 and 2.	
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	Students will be able to: 1. Compare power transmissions with gears 2. Explain the geometry of the cylindrical gears 3. Design and calculate the power transmission with cylindrical gears. 4. Explain the working principle of the planetary gears. 5. Compare different types of couplings and clutches. 6. Calculate friction clutches.	
Course content broken down in detail by weekly class schedule (syllabus)	Course content	L hours
Course content broken down in detail by weekly class schedule (syllabus)	Power transmissions and mechanical drives. Classification. Transmission ratio. Efficiency. Multi-step drives.	2
	Features and classification of gear drives	1
	Geometry of cylindrical gears. Involute and cycloid. Involute of circle. Main rule of toothing. Involute toothing	1
	Fundamentals of cylindrical gears manufacture. Profile shift. Tooth root undercutting.	1
	Gear dimensions. Gear control measures. Parameters of a gear pair.	1
	Contact ratio.	1
	Helical gears: generation, manufacture, dimensions.	1
	Equivalent gear. Helical gear overlaps	1
	Gear loadings.	1
	Pitting load capacity	1
	Tooth root load capacity	1
	Gear lubrication. Gearbox design. Gear materials.	1
	Bevel gears. Geometry. Transmission ratio.	1
	Planetary gear trains. Definition and classification. Planetary transmission kinematics. Transmission ratio.	1
	Features of planetary gear trains. Mating conditions	1
	Forces, torques and power of planetary gear trains. Efficiency.	1
	Bevel differential trains.	1
	Couplings and clutches. Classification. Rigid couplings.	1

	Compensating couplings.	1
	Oldham and universal coupling.	1
	Flexible couplings.	1
	Clutches. Friction clutches. Dynamics of inclusion.	1
	Dimensioning of the friction clutches.	1
	Hydrodynamic clutches.	1
	Centrifugal clutches.	1
	List of laboratory or design exercises	DE hours
	Design of the 1-stage gearbox	39

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	Course attendance and activity (lectures, exercises), machine elements design, studying.	

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	4
	Essay		Seminar essay		(Other)	
	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 13 weeks of classes. In the final exams students that did not pass the midterm exams take part. Grade (%) = 0,3K + 0,35(M1 + M2) K - rating from design exercises expressed in percentage, M1, M2 - points of first mid-term exams expressed in percentage, mid-term exams consist of theoretical questions. The requirement for a positive evaluation is the positive assessment of design exercises K >= 45%, the first mid-term M1 >= 45%, and the second mid-term M2 >= 45%. The final grade is determined as follows: Percentage - Rating 50% to 61% - Sufficient (2) 62% to 74% - Good (3) 75% to 87% - Very good (4) 88% 100% - Excellent (5) Students who do not get positive evaluation through mid-term exams take written numerical and theoretical exam.

	Title	**Number of copies in the library**	**Availability via other media**
Required literature (available in the library and via other media)	Jelaska, D: Machine Elements, I part, University of Split, 2007. (in Croatian)	10	
	Jelaska, D: Gears and Gear Drives, University of Split, 2011. (in Croatian)	10	
	Podrug, S.: Machine Elements - Workbook, 2005. (in Croatian)		e-learning portal
	Jelaska, D., Podrug, S.: Friction Clutch Design (Directions), FESB, Split, 2001. (in Croatian)		e-learning

			portal
	Jelaska, D., Podrug, S., Radica, D.: Cylindrical Gears Design (Directions), FESB, Split 2010. (in Croatian)	5	
Optional literature (at the time of submission of study programme proposal)	- Decker, K.H.: Machine Elements, Tehnička knjiga, Zagreb, 2006. (in Croatian) - G. Niemann: Maschinenelemente I, II, Springer Verlag, 1990. (in German)		
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	MACHINING AND MACHINE TOOLS							
Code	FETR12	Year of study	2					
Course teacher	Dražen Bajić, Ph. D., Full Professor	Credits (ECTS)	6					
Associate teachers	Sonja Jozić, Ph. D., Assistant Professor Mario Veić, Teaching assistant	Type of instruction (number of hours)	L	S	AE	LE	DE	
			45	0	0	30	0	
Status of the course	Obligatory	Percentage of application of e-learning	0					

COURSE DESCRIPTION

Course objectives	Training students for: • acquisition of basic knowledge of metal removal processes. • acquisition of technical possibilities of machine tools.		
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. classify mechanical technologies 2. classify metal removal processes and explain importance each of them 3. sketch machine tools and equipment for particular machining operations 4. present the principles of operation and application of machine tools 5. characterize features of machine tools 6. comment expressions to calculate the cutting speed, material removal volume, cutting force, power, theoretical roughness and the main machine time for particular machining operations 7. comment the mechanisms and forms of tool wear in machining		
Course content broken down in detail by weekly class schedule (syllabus)	Course content	L or S hours	AE hours
	Introduction and classification of metal-removal processes. Tool and workpiece motion, basic tool geometry	3	
	Models of chip formation, shape and size of chip. Conditions of occurrence of build up edge.	3	
	Cutting forces, power, vibrations during machining. Thermal phenomena in cutting.	3	
	Tribology of machining process.	3	
	Cutting-tool materials.	3	
	Quality of machined surface.	3	
	Classification of machine tools. Structure and technical charateristics of machine tools.	3	
	First midterm exam		
	Main parts and mechanisms of machine tools. Bearing elements, guides, spindle bearings, driving system of machine tools.	3	
	Conventional machine tools with defined tool edge: turning machines, drilling machines	3	
	Conventional machine tools with defined tool edge: milling machines, planing machines, broaching machines, sawing machines	3	
	Conventional machine tools with undefined tool edge. Machines for gear wheels manufacturing.	3	
	CNC machine tools. Control systems, basic concept of CNC programming, automatic tool change, automatic workpiece	3	

	change.		
	Machine tools for high performance machining operation, flexible manufacturing cells, flexible manufacturing systems. High Speed machine tools.	3	
	Second midterm exam		
	List of laboratory or design exercises		LE or DE hours
	Introduction to machine tools installed in laboratory. Turning, tool and workpiece geometry, Chip shapes, Cutting-tools materials.		2
	Turning, thread and taper production,		2
	Planing and slotting, compression rate measurement.		2
	Drilling, sinking, and reaming. Measuring the axial force and torque for drilling.		2
	Sawing, broaching. Measuring the main cutting force for turning using the power consumption.		2
	Milling. Measuring the surface roughness in relation with cutting parametars.		2
	Grinding, honing, superfinishing.		2
	Movement, typical parts and mechanisms of machine tools installed in the laboratory. Determination of degree of machine tool workspace efficency.		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
	Rigidity of the system machine-tool-woorkpiece. Zero point of the workpiece and zero point of the tool at vertical machining center.		2
	Determination of gearbox efficiency on turning machine.		2
	CNC programming. Preparation and model production using 3D printer.		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	2,5	Research		Practical training	0,5
	Experimental work	0.5	Report		Reports from the laboratory exercises	
	Essay		Seminar essay		(Other)	2.5
	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: 3. Positive assessment of laboratory exercises 4. 50 % points on each midterm exam or the final exam. Grade (in percentage) is formed according to the formula: Grade(%) = 0,5 (M1 + M2)

<table>
<tr><td></td><td colspan="3">M1, M2 – test results of first and second midterm exam.
Final grade is determined according to:
Percentage Grade
50% do 61% sufficient (2)
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>Bajić, D. “Obrada odvajanjem i alatni strojevi”, autorizirana predavanja.</td><td></td><td>eLearning portal</td></tr>
<tr><td>Ekinović S.: “Postupci obrade rezanjem”, Univerzitet u Sarajevu, Mašinski fakultet u Zenici, 2003.</td><td></td><td></td></tr>
<tr><td>Ekinović S.: “Mašine alatke”, Univerzitet u Sarajevu, Mašinski fakultet u Zenici, 2001.</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">- 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	MARINE MACHINERY AND DEVICES						
Code	FESS35	Year of study	3.				
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	30	0	0
Status of the course	Elective	Percentage of application of e-learning	0				

COURSE DESCRIPTION			
Course objectives	Training students for: • understanding basic principles of marine machineries and devices , • understanding application of marine machineries and devices.		
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: - analyze basic principles of marine machineries and devices, - recommend auxiliary machinery and devices for requested application, energy demand and according to rules and regulation,		
Course content broken down in detail by weekly class schedule (syllabus)	Course content	L or S hours	AE hours
	Marine machineries development. Steam boilers systems.	2	2
	Marine steam turbines systems.	2	2
	Marine gas turbines systems.	2	2
	Marine propulsion engines systems.	2	2
	Main parameters of marine engines	2	2
	Application of marine engine. Test bed and sea trial.	2	2
	Fuel, oil, cooling systems.	2	2
	Marine auxiliary engines, pumps, fans, compressors.	2	2
	Heat exchangers, fuel and oil separators.	2	2
	Deck machinery.	2	2
	Propeller systems.	2	2
	Rudder system. Ballast and bilge water system. Fire fighting systems, inert gas system	2	2

	Diesel-electric propulsion. Combined propulsion systems. IMO regulation.	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		

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	3,7
	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 test-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:

$$\text{Grade}(\%) = 0{,}54\ (M1 + M2)$$

the activities in percentage:

- M1, M2 – test results.

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

Title	Number of copies in the library	Availability via other media
Radica G. Predavanja iz predmeta Brodski strojevi i uređaji		e-learning
Grljušić M. Pogonski pomorski sustavi. Interna skripta, FESB, 2001.	5	
Ozretić, V.: "Brodski pomoćni strojevi i uređaji", Split Ship Management, Split, 2004	5	

Optional literature (at the time of submission of study programme proposal)	• Woodyard , D.:Pounder's Marine Diesel Engines and Gas Turbines,UK,2009. • Harrington, R.L., "Marine Engineering", SNAME, N.J. USA, 1992. • Haarlas, M., "Steam and Gas Turbines for Marine Propulsion", Naval Institute Press, Annapolis, Maryland, 1987. • Parat, Ž., "Brodski motori s unutarnjim izgaranjem", Sveučilište u Zagrebu, FSB,2005. • Ozretić, V., "Brodski pomoćni strojevi i uređaji", Split Ship Management, Split, 2004.		
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)	Available in English language.		

NAME OF THE COURSE	MATERIALS							
Code	FETR01	Year of study	1					
Course teacher	Nedjeljko Mišina, Ph. D., Full Professor, Dražen Živković, Ph. D., Full Professor	Credits (ECTS)	6					
Associate teachers	Nikša Čatipović, Teaching assistant, Zvonimir Dadić, Teaching assistant	Type of instruction (number of hours)	L	S	AE	LE	DE	
			45	0	0	30	0	
Status of the course	Obligatory	Percentage of application of e-learning	0					

COURSE DESCRIPTION

Course objectives	Training students for: - Present the basic knowledge about materials structure. - The mechanical properties and their relationship to the structure of the material. - Explain the mechanical properties testing, both for materials and complete construction. - Basic detection methods for errors in materials and metal structures. Present the alloys basic phase diagrams, especially phase diagrams for Fe - C alloys, as well as the properties of iron alloys. - Provide an overview and explanation of the basic principles of metal heat treatment, chemical diffusion and surface heat treatment		
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: - Analyze the processes of crystallization and as well as specifics metastable and stable crystallization of Fe-C alloy, - Explain the procedures of testing the basic mechanical properties of materials, - Characterize polymer and composite materials, - Analyze the properties and areas of application of steel, casting alloys and non-ferrous metals - Use optical microscopy - Explain the testing materials methods of the structures without damage, - Choose a suitable surface heat treatment - Combine processes of heat treatment		
Course content broken down in detail by weekly class schedule (syllabus)	Course content	L hours	AE hours
	Introduction, distribution of materials, structure of atoms, bonding atoms, pure metals, cooling curves of pure metals, alloys, amorphous materials, the characteristics of crystal structures.	3	0
	The solidification phenomena, transformation in solids, alloys, phase in alloys, irregularities of crystalline lattice.	3	0
	The phase diagram formation, the distribution of alloys, the diagram of complete solubility in solids, eutectic diagram.	3	0
	Peritectic diagram, diagram of complete non solubility in solids, plastic deformation in the cold state, technical metals and their alloys.	3	0
	Stable Fe-C phase diagram, Maurer diagram, cast iron, ductile iron.	3	0

	The metastable phase diagram Fe-Fe_3C, steel, cast steel. white cast iron, hard cast iron, malleable iron, iron alloy, nonferrous metals and their alloys.	3	0
	Bearing alloys - friction bearings, bearing type alloys, sintered materials - application. Material testing - testing of tensile strength (Hook's law), bending test, dynamic strength testing.	3	0
	First midterm exam		
	Impact test, hardness testing Rockwell B and C, Vickers and Brinell, Shore and Poldy.	3	0
	Non-destructive testing: penetrating fluids, ultrasound, X-rays, isotopes, magnetic testing. Testing of chemical composition	3	0
	Introduction to heat treatment of metals, basic heat treatment of ferrous alloys, phenomena of a faster austenite cooling, TTT diagrams.	3	0
	Hardening, Quenching,Tempering.	3	0
	Annealing (normalization, softened by annealing, annealing to tension relaxation, high-temperature annealing, homogenization annealing).	3	0
	Surface heat treatment methods (surface hardening, diffusion processes, chemical diffusion processes).	3	0
	Second midterm exam		
	List of laboratory or design exercises		LE
	Recording cooling curves of pure metals, obtaining phase diagrams from the cooling curves		2
	Phase diagram with complete solubility. Allotropes modifications.		2
	Eutectic phase diagram. Curie point.		2
	Stable Fe - C phase diagram		2
	Metastable Fe - Fe_3C phase diagram		2
	Tensile strength testing		2
	Charpy impact toughness test. Dynamic strength testing. Sparks testing		2
	First midterm exam		
	Hardness testing methods: Brinell, Poldy, Rockwell B and C, Vickers and Shore		2
	X-rays, isotopes, magnetic testing, ultrasound, penetrating liquids		2
	Hardness after hardening. Testing by the Grossman method for hardenability.		2
	Testing by the Jominy method of hardenability.		2
	Normalization, Annealing		2
	Heat treatment of aluminium alloys		2
	Second midterm exam		

Format of instruction	☒ lectures ☐ seminars and workshops ☒ exercises ☐ *on line* in entirety ☐ partial e-learning ☐ field work	☐ independent assignments ☒ multimedia ☒ laboratory ☐ work with mentor ☐ (other)
Student responsibilities	The presence in lectures and exercises in the amount of at least 70%. 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*	Class attendance	1,5	Research		Practical training	
	Experimental work		Report		Self-directed learning	3,5
	Essay		Seminar essay		Laboratory exercises	1,0
	Tests		Oral exam		(Other)	

equal to the ECTS value of the course)	Written exam		Project		(Other)	

Grading and evaluating student work in class and at the final exam	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. Usually it consists of 10 test questions and the two tasks. The requirements for a positive evaluation are: positive assessment of laboratory 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) 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 relative ECTS grading system in accordance with the study rules and study system of the University of Split. A group of students who passed the exam is divided into four sub-groups: 15% of the best students are graded excellent, 35% following very good, the next 35% a good grade and the last 15% positive grade. Students who did not pass the exam after two final exams have the last chance to pass exam in the autumn period where they can get a positive grade. Overall material has to be passed at last possible exam. The written exam consists of test with 20 questions and three tasks. The exam lasts 90 minutes.

Required literature (available in the library and via other media)	**Title**	**Number of copies in the library**	**Availability via other media**
	N. Mišina: the author's lecture, FESB		E-learning
	D. Živković, the author's lecture, FESB		E-learning

Optional literature (at the time of submission of study programme proposal)	Deželić, R.: Metali (II dio), FESB, Split, 1998. Deželić, R.: Metali (I dio), FESB, Split, 2005. Kovačiček, F., Španiček,Đ., „Materijali – osnove znanosti o materijalima“, FSB, Zagreb, 2000.
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	MATHEMATICS						
Code	FEMY03	Year of study	1				
Course teacher	Ivančica Mirošević, Lecturer	Credits (ECTS)	7				
Associate teachers	Lea Dujić, Teaching assistant, Marija Čatipović, Teaching assistant Marina Mandić, Teaching assistant	Type of instruction (number of hours)	L	S	AE	LE	DE
			45	0	45	0	0
Status of the course	obligatory	Percentage of application of e-learning	10				

COURSE DESCRIPTION

Course objectives	Training students for: application of mathematical concepts and tools from the area of linear algebra, vector calculus, analytic geometry, diferential calculus, analysis of real functions of real variable, sequences and series of numbers and functions, to solving engineering problems.		
Course enrolment requirements and entry competences required for the course	Good knowledge of High School mathematics and passed State Exam in Mathematics.		
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	Students will be able to: - state definitions and theorems from the enitre course, - illustrate theorems with examples, - solve systems of linear equations, - apply vector calculus in engineering, - interpret derivatives mathematically, geometrically and physically, - analyse functions of one variable, - test convergence of sequences and series of numbers and functions. - identify integrals which are elementary integrable and solve them. - analyze the extrema of real functions of several variables.		
Course content broken down in detail by weekly class schedule (syllabus)	Course content	L or S hours	AE hours
	1. Introduction. Sets of numbers, complex numbers, trigonometric form of complex number, Moivre formulas.	3	3
	2. Matrices. Basic operations with matrices. Matrix formulation of system of linear equations. Gaussian elimination. Linear independence and rank of a matrix. Kronecker-Capelli theorem.	3	3
	3. Inverse matrix. Determinants. Laplace expansion of a determinant. Cramer's rule.	3	3
	4. Vectors. Basic operations with vectors. Coordinate system. Unit vector and cosines of directions. Linear independence of vectors and basis of a space. Scalar (dot) product, vector product and mixed product.	3	3
	5. Functions of a real variable: defining function, classification of functions. Review of elementary functions.	3	3
	6. Limits and continuity. Asymptotes.	3	3
	7. Derivatives and differential. Tangent and normal. L'Hospital's rule and limits of undetermined forms.	3	3
	8. Monotonicity. Necessary and sufficient conditions for extrema. Curvature. Sufficient condition for convexity and concavity. Necessary and sufficient conditions for inflection	3	3

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

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

Screening student work *(name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)*	Class attendance	3	Research		Practical training	
	Experimental work		Report		Self study	3.6
	Essay		Seminar essay		(Other)	
	Tests	0.2	Oral exam		(Other)	
	Written exam	0.2	Project		(Other)	

Grading and evaluating student work in class and at the final exam	During semester initial exam and two mid-term exams are held. Initial exam is scheduled after two weeks of lectures, the first mid-term exam is scheduled after 7 weeks of lectures, and the second in the week following the lectures. At the initial exam students can get 10 points, and at each mid-term exam 35 points, while the remaining 20 points are attained through assignements during lectures and excercises. The condition for passing the course is minimum 18 points on each mid-term exam and a total of at least 50 points. After semester, two final exams and a correction exam are held. Students which did not pass one mid-term exam, can take only this part of the exam during final exams. Students which did not pass any mid-term exam, take the final exam with comprehensive course content. In that case, maximum numbers of available points is 70. The condition for passing the course is minimum 35 points in the final exam and a total of at least 50 points. The grade is formed after the second final exam according to article 75 of the

<table>
<tr><td></td><td colspan="3">Statute of FESB:
15% of the best students get the mark excellent (5),
next 35% students get the mark very good (4),
next 35% students get the mark good (3)
and the last 15% students get thet mark sufficient (2).
Students who did not pass the course after final exams, and have obtained total of at leat 10 points, can attend the correction exam. On the correction exam maximal number of points is 100, and the minimum requirement for a passing grade is 50 points. Mid-term exams, final exams and correction exams are held according to the exam schedule.</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>Bradić T., Pečarić J., Roki R., Strunje M.: Matematika za tehnološke fakultete, Element Zagreb, 1998.</td><td></td><td></td></tr>
<tr><td>Rivier K.: Zbirka riješenih zadataka I, II, III, Veleučilište u Splitu 2003.</td><td></td><td></td></tr>
<tr><td>Lecture materials on FESB e-learning portal.</td><td></td><td>https://elearning.fesb.unist.hr</td></tr>
<tr><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td></td></tr>
<tr><td>Optional literature (at the time of submission of study programme proposal)</td><td colspan="3">- Šego, B., Matematika za ekonomiste, Narodne novine, Zagreb, 2005.
- I. Slapničar, Matematika 1, FESB, Split, http://lavica.fesb.hr/mat1
- I. Slapničar, Matematika 2, FESB, Split, http://lavica.fesb.hr/mat2
- B. P. Demidovič, Zadaci i riješeni primjeri iz više matematike s primjenom na tehničke nauke, Tehnička knjiga, Zagreb, 1995.
- Dž. Lugić, Matematika II (metodički riješeni zadaci)
- B. Apsen, Repetitorij više matematike 1., 2., 3. i 4, Tehnička knjiga, Zagreb
- S. Pavasović i ostali, Matematika - riješeni zadaci, Građevinski fakultet, Split</td></tr>
<tr><td>Quality assurance methods that ensure the acquisition of exit competences</td><td colspan="3">- homework
- short tests
- quizzes
- mid-term exams
- final exam
- student questionnaires</td></tr>
<tr><td>Other (as the proposer wishes to add)</td><td colspan="3"></td></tr>
</table>

NAME OF THE COURSE	MEASUREMENTS IN ENGINEERING							
Code	FETR07	Year of study	3.					
Course teacher	Frano Barbir, Ph.D.,Full Professor Boženko Bilić, Ph.D.,Full Professor	Credits (ECTS)	5					
Associate teachers	Jakša Galić, Teaching assistant, Ivan Tolj, Ph.D., 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 the basic principles of the metrology theory and technique • Acquiring specific skills in methods and techniques of metrology and control.		
Course enrolment requirements and entry competences required for the course	Completed the first year of vocational study of mechanical engineering or naval architecture.		
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	Students will be able to: 1. Interpret metrological terms 2. Classify measurement errors 3. Perform measurements in the field of industrial metrology (measurement of lengths, forms and shapes, measurement of temperature, pressure, fluid flow velocities and flow rates, measurements of thermal conductivity and specific heat capacity, and relative humidity and dew point measurements) 4. Assess the results of measurements on the basis of critical thinking and intellectual honesty.		
Course content broken down in detail by weekly class schedule (syllabus)	Course content	L hours	AE hours
	Introduction in metrology. Basic terms in metrology. Physical quantities and measurement units. Measurement errors. Statistical analysis of measurement results: Mean and standard deviation. Gaussian distribution of random measurement errors.	2	0
	Statistical analysis of measurement results: Experimental standard deviation of the mean. Measurement uncertainty. Expression of measurement result.	2	0
	Methods for measuring lengths and forms. Systematic errors in the measurement of lengths and forms.	1	
	Measuring instruments for measuring lengths, forms and positions.	2	
	Measurement and control of angles.	2	
	Measurement and control of threads.	2	
	Measurement and control of gears. Measurement and control of surface roughness.	2	
	Measurement the forms and positions.	1	
	First midterm exam		
	Temperature measurements: basic definitions, temperature scales, glass thermometers.	2	0
	Temperature measurements: bimetallic thermometers, resistance temperature detectors (RTDs), thermistors, thermocouples, pyrometers (direct or total irradiation).	2	0
	Pressure measurements: basic definitions, atmospheric	2	0

	pressure, gauge pressure and vacuum, barometers, manometers, piston manometers, pressure transducers.		
	Fluid flow velocities measurements: instruments for dynamic pressure measurements, glowing wire or foil instruments, Doppler effect instruments, rotational anemometers. Fluid flow rate measurements: principle of flow field integration, gravimetric and volumetric methods.	2	0
	Fluid flow rate measurements: Orifices and nozzles, principle of hydromechanics resistors, volumetric flow integrators, propeller flow instruments, electromagnetic flow instruments.	2	0
	Measurements of heat fluxes, measurements of thermal conductivity coefficient, measurement of specific heat, measurement of relative humidity and dew point, Measurement of exhaust gases composition: chemical mechanical, chromatographic and optical analyzers.	4	0
	Second midterm exam.		
	List of laboratory exercises		LE hours
	Introduction with measuring instruments intended for the measurement of dimensions, forms and positions. Certification the dial indicator according to standard DIN 878. Indirect measurement of the distance between the hole centers using a special vernier caliper. Measurement an inside diameter using three-point inside micrometer.		2
	Comparative measurement of an internal diameter using bore gauge Measurement angle prism using gauge blocks, rollers and dial indicator Measurement angle of prism using the protractor (direct contact measurement).		2
	Measurement the cone angle using sine bar. The measurement of the internal angle of the cone. Measurement the pitch diameter of thread using screw thread micrometer.		2
	Dividing head: indirect indexing and differential indexing. Three-wire method of measuring pitch diameter.		2
	Direct method for tooth thickness measurement by means of a gear tooth caliper. Direct method for tooth thickness measurement by means of a disc-type micrometer (measurement over a several teeth). Runout measurement on gear.		2
	Measurement of flatness. Runout measurement on shaft. Surface roughness measurement.		2
	Plan of quality control.		2
	Correction and calibration of thermocouples		2
	Calibration of Pt100; calibration of a manometer.		2
	Measurement of heat flux.		2
	Anemometer and glowing ball; digital pressure instrument.		2
	Transparent cooling system discussed from the measurements standpoint.		2
	Experimental airconditioning/water heater system discussed from the measurements standpoint.		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	The presence on lectures and exercises in the amount of at least 70 % of the times		

<table>
<tr><td>responsibilities</td><td colspan="6">scheduled. Perform all laboratory exercises.</td></tr>
<tr><td rowspan="5">Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)</td><td>Class attendance</td><td>1,5</td><td>Research</td><td></td><td>Practical training</td><td></td></tr>
<tr><td>Experimental work</td><td></td><td>Report</td><td></td><td>Individual work</td><td>3</td></tr>
<tr><td>Essay</td><td></td><td>Seminar essay</td><td></td><td>Laboratory exercises</td><td>0,5</td></tr>
<tr><td>Tests</td><td>0</td><td>Oral exam</td><td></td><td>Preparation for laboratory exercises</td><td>0</td></tr>
<tr><td>Written exam</td><td>0</td><td>Project</td><td>1</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">Course consists of two parts:
1. Dimensional measurement – MOD (course teacher: Ph.D. Boženko Bilić, senior full professor)
2. Measurement in the thermodynamics – TOP (course teacher: Ph.D. Frano Barbir, senior full professor)

During semester there are two midterm exams. The first midterm exam is after 7 weeks of lecturing and refers to the teaching materials of the first part of the course. The second midterm exam is after next 6 weeks and refers to the teaching materials of the second part of the course.
The requirement for passing grade represents minimal 50% points on each midterm exam:

Grade (%) = 0,5(MOD + TOP)

MOD – percentage points achieved on the first part of course
TOP – percentage points achieved on the second part of course
In the final exams students that did not pass at least one of the midterm exams take part. The requirement for passing grade represents minimal 50% points final exam.
Requirement for access to the midterm exams and final exams is regularly attended classes. Midterm and 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.

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 colspan="3">Title</td><td>Number of copies in the library</td><td>Availability via other media</td></tr>
<tr><td colspan="3">B. Bilić: Teorija i tehnika mjerenja, FESB, Split, 2007.</td><td>5</td><td></td></tr>
<tr><td colspan="3">B. Bilić: Predavanja postavljena na e-learning portalu FESB-a</td><td></td><td>e-learning</td></tr>
<tr><td colspan="3">F. Barbir: Ispis predavanja u Powerpoint-u</td><td></td><td>e-learning</td></tr>
<tr><td colspan="3">R. S. Figliola, D. E. Beasley: Theory and Design for Mechanical Measurements”, John Wiley & Sons, 2011.</td><td></td><td></td></tr>
<tr><td>Optional literature (at the time of submission of study programme proposal)</td><td colspan="6">- T. G. Beckwith, R. D. Marangoni, J. H. Lienhard: Mechanical Measurements, Addison-Wesley Publishing Company
- M. Brezinšćak: Mjerenja i računanje u tehnici i znanosti, Tehnička knjiga, Zagreb, 1970
- F. T. Farago, M. A. Curtis: Handbook of Dimensional Measurement, Industrial Press Inc, New York, 1994.</td></tr>
</table>

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
Other (as the proposer wishes to add)	

<table>
<tr><td>NAME OF THE COURSE</td><td colspan="7">MECHANICS OF MATERIALS</td></tr>
<tr><td>Code</td><td>FESR04</td><td>Year of study</td><td colspan="5">1.</td></tr>
<tr><td>Course teacher</td><td>Vedrana Cvitanić, Ph. D., Associate Professor</td><td>Credits (ECTS)</td><td colspan="5">6</td></tr>
<tr><td rowspan="2">Associate teachers</td><td rowspan="2">Marko Vukasović, Ph. D., Teaching assistant
Maja Kovačić, 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>30</td><td>0</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="8">COURSE DESCRIPTION</td></tr>
<tr><td>Course objectives</td><td colspan="7">Training students for:
• understanding and application of basic knowledge of mechanics of solid bodies,
• solving problems related to determination of stress and strain distributions for beams under different types of loading (axial, torsion, bending, shear and combined loading).</td></tr>
<tr><td>Course enrolment requirements and entry competences required for the course</td><td colspan="7">Statics (Technical mechanics 1)</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:
1. explain plane stress state and plane strain state as well as stress-strain relationship (Hooke's law),
2. analyze plane stress state using Mohr's stress circle,
3. calculate geometrical properties of beam cross sections,
4. determine stresses and displacements for beams under tension/compression, torsion loading, bending loading or shear loading,
5. apply allowable stress and allowable strain design procedures to analyze and design simple structures,
6. solve statically indeterminate problems by using additional deformation conditions,
7. analyze beams under combined loading using simple failure theories,
8. summarize problem of column buckling.</td></tr>
<tr><td rowspan="6">Course content broken down in detail by weekly class schedule (syllabus)</td><td colspan="5">Course content</td><td>L hours</td><td>AE hours</td></tr>
<tr><td colspan="5">Introduction to mechanics of materials. Problems and methods of mechanics of materials. Modelling of structures.
Stress vector, normal and shear stress. Stress tensor.</td><td>3</td><td>2</td></tr>
<tr><td colspan="5">Stress transformation. Principal stresses. Mohr's circle for plane stress state.
Strain. Normal strain, shear strain and dilatation. Strain tensor. Strain transformation. Mohr's circle for plane strain state.</td><td>3</td><td>2</td></tr>
<tr><td colspan="5">Stress-strain relationship. Experimental data for technical materials. Hooke's law for uniaxial stress state. Plane stress state. Relationship between elasticity constants. Relationship between internal force components and stress components.</td><td>3</td><td>2</td></tr>
<tr><td colspan="5">Geometrical properties of beam cross sections. First and second moment of area. Transformation of second moments of area under translation of coordinate system. Transformation of second moments of area under rotation of coordinate system. Mohr's circle for second moments of area. Radius of gyration.</td><td>3</td><td>2</td></tr>
<tr><td colspan="5">General approach to problems of mechanics of materials.
Axial loading of beams. Prismatic beams and beams with variable cross sectional area. Displacement diagram. Stress concentration.</td><td>3</td><td>2</td></tr>
</table>

	Torsion loading of circular beams. Assumptions and constraints. Shear stress and strain. Allowable stress design. Bending of beams. Assumptions and constraints.	3	2
	Stress and strain distributions for pure bending. Stress and strain distributions for transverse bending. Allowable stress design. Ideal section modulus.	3	2
	Differential equation of elastic deflection curve. Moment-area method.	3	2
	Stresses and strains for bending of beams with non-uniform cross section. Shear loading. Statically indeterminate problems in axial loading.	3	2
	Thermal effects, setting misfits and prestrains. Statically indeterminate problems in torsion loading. Statically indeterminate problems in bending.	3	2
	Strain energy. Failure theories.	3	2
	Failure theories for combined loading problems of beams.	3	2
	Buckling of columns. Stable, unstable and indifferent equilibrium state. Buckling of columns in elastic state. Buckling of columns in plastic state. Design formulas for columns.	3	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	2,2	Research		Practical training	
	Experimental work		Report		Individual work	3,5
	Essay		Seminar essay		Laboratory exercises	
	Tests	0,2	Oral exam		Preparation for laboratory exercises	
	Written exam	0,1	Project		(Other)	

Grading and evaluating student work in class and at the final exam	There are two midterm exams during the semester. After semester there are two final exam terms and one corrective exam term according to schedule. The first midterm exam is after 7 weeks of lecturing and the second one is after the next 6 weeks of lecturing. Each midterm exam is written and test consists of theoretical questions and numerical problems. The requirement for passing grade is 50% points on each midterm exam. In the final exams students that did not pass the midterm exams take part. In the corrective exam students take whole exam. Final number of points is formed according to the formula: Points(%)= (M1 + M2)/2 M1, M2 – points on midexams. Final grade is determined after the second final exam by relative system of grading according to Regulations of studies and study system of University of Split. Based on the achived number of points students that have passed the exam are distributed into four groups: 15% of the best students get grade excellent (5), following 35% students get grade very good (4), following 35% students get grade good (3) and last 15% students get grade sufficient (2). If the total number of students that have passed the exam at midterms and final

<table>
<tr><td></td><td colspan="3">exams is lower than 30, the final grade is determined by absolute system of grading. In this case, the final grade is determed by the achived final number of points in the following manner: from 50% to 61% - grade sufficient (2), from 62% to 74% - grade good (3), from 75% to 87% - grade very good (4) and from 88% to 100% - grade excellent (5).

Students can access the corrective exam term if they have achived at least 10% points on midterm exams or final exams.

According to Article 71 of Faculty Statue, students are obligate to contribute in all education activities and to attend at least 70% of lecture and exercise lessons. Above conditions are necessary to access midterm and final exams.</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>Alfirević, I., „Nauka o čvrstoći I“, Tehnička knjiga, Zagreb, 1989.</td><td></td><td></td></tr>
<tr><td>Matoković, A., Plazibat, B., „Nauka o čvrstoći 1 – zbirka zadataka“, FESB.</td><td></td><td></td></tr>
<tr><td>Cvitanić, V., „Predavanja iz kolegija Mehanika materijala“, FESB.</td><td></td><td>e-learning portal</td></tr>
<tr><td>Vlak, F., Jurjević, D., „Nauka o čvrstoći 1 – zbirka zadataka“, FESB.</td><td></td><td>e-learning portal</td></tr>
<tr><td>Optional literature (at the time of submission of study programme proposal)</td><td colspan="3">Craig, R., R.: Mechanics of Materals, John Wiley & Sons, New York, 2000.</td></tr>
<tr><td>Quality assurance methods that ensure the acquisition of exit competences</td><td colspan="3">– recording student’s presence on lessons
– 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	METAL FORMING BY DEFORMATION						
Code	FETR04	Year of study	2				
Course teacher	Branimir Lela, Ph. D., Assistent Professor	Credits (ECTS)	5				
Associate teachers	Jure Krolo, 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	10%				

COURSE DESCRIPTION

Course objectives	Training students for: • getting knowledge about metal forming technologies • getting familiar with specific characteristics of various forming methods based on plastic deformation
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. classify processes of metal forming 2. explain the importance of metal forming technology 3. describe processes and machines used in metal forming 4. consider flow stress and flow rule 5. discus about terms for calculating forces, stresses, strains and strain rates in metal forming processes 6. describe and explain material flow, friction factor, flow stress, work and power in metal forming processes

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

Course content	L hours	AE hours
Introduction; Classification of metal forming processes	2	/
Concept of plastic deformation	2	/
Indicators of deformability	2	/
Changes in materials caused by plastic deformation	2	/
Anisotropy; Strain and strain rate	2	/
Flow stress and flow curves	2	/
Yield criteria	2	/
First midterm exam		
Upsetting and forging processes	2	/
Drawing processes	2	/
Extrusion processes	2	/
Rolling processes	2	/
Sheet metal forming by bending and deep drawing	2	/
Sheet metal forming by spinning and stamping	2	/
Second midterm exam		

List of laboratory exercises	LE hours
Influence of deformation on mechanical properties	2
Examination of material flow	2
Determination of friction factor by upsetting cylindrical specimen	2
Determination of friction factor by ring upsetting	2
Determination of flow stress by upsetting cylindrical specimen	2
Determination of flow stress by strip upsetting	2

	Examination of workability by upsetting	2
	Examination of workability by open die forging	2
	Examination of workability by drawing	2
	Examination of workability by extrusion	2
	Examination of workability by deep drawing	2
	Sheet forming by bending using rectilinear tool movement	2
	Determination of springback during sheet bending	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 at the lectures at least 70% and at the laboratory exercise 100% of the time scheduled. Preparation and submission of reports from 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	1	Report		Individual work	1
	Essay		Seminar essay		Laboratory exercises	1
	Tests		Oral exam		(Other)	
	Written exam		Project		(Other)	

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

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.
The requirement for positive grade is positive assessment of the laboratory exercises and 50% points on each midterm.
Grade is forming in accordance with the following formula:
Grade (%)=(M1 + M2)/2
M1, M2 – score on midterms in percentage (%)
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.

Examination terms: according to the timetable

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

Title	**Number of copies in the library**	**Availability via other media**
Duplančić, I.: "Obrada deformiranjem", Sveučilište u Splitu, FESB, Split 2007.	5	

Optional literature (at the time of

- Povrzanović, A. "Obrada metala deformiranjem – odabrana poglavlja", Sveučilište u Zagrebu, Fakultet strojarstva i brodogradnje, Zagreb, 1996.

submission of study programme proposal)	- Math M., “Uvod u tehnologiju oblikovanja deformiranjem”, Sveučilište u Zagrebu, Fakultet strojarstva i brodogradnje, Zagreb, 1999. - Lange K.: "Lehrbuch der Umformtechnik I, II, III", Springer - Verlag Berlin, Heidelberg, New York, 1974.
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	METAL STRUCTURES DESIGN						
Code	FESR23	Year of study	3				
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	0	30
Status of the course	Obligatory	Percentage of application of e-learning	40%				

COURSE DESCRIPTION

Course objectives	Training students for: • Designing and maintaining of simple metal structures. Acquiring knowledge from types of structural materials, optimal designing, typical joints, corrosion and testing (control) of metal structures. • Design and project documentation based on CAD software SolidWorks. • Numerical modelling of metal structure based on finite element simulation and software ADINA.
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. Conceive and construct simple metal structure. 2. Prove the structure carrying capacity. 3. Explain calculation of weldments and bolt connections. 4. Carry out anti-corrosive protection. 5. Use results of finite element model simulation. 6. Carry out calculation of weldment and bolt connection. 7. Describe non-destructive testing base on visual testing, magnetic particles inspection, ultrasound testing and penetrant testing.

Course content broken down in detail by weekly class schedule (syllabus)	Course content	L or S hours	AE hours
	Introduction to metal structures and structural design. Contracting of metal structures.	4	
	Materials for metal structures (Aluminium alloys and steel)	4	
	Actions on structures according to HRN, DIN, EUROCODE 3	4	
	Metal structures optimal design.	2	
	Bolt connections with dimensioning.	4	
	Weldments with dimensioning.	4	
	Design of weldments and bolt connections with respect to fatigue.	2	
	Anti-corrosive protection.	2	
	Contracting and renewal of anti-corrosive protection.	2	
	List of laboratory or design exercises		DE hours
	Introduction to SolidWorks and creating metal structure concept in SW.		8
	Demonstration of NDT methods (visual testing, penetrant testing, magnetic particles inspection, ultrasound testing)		4
	Introduction to the finite element method software ADINA		8
	Simulation of structure loading in ADINA.		8

Format of instruction		
	☒ lectures ☒ seminars and workshops ☐ exercises	☒ independent assignments ☐ multimedia ☒ laboratory

<table>
<tr><td></td><td colspan="3">☐ on line in entirety
☐ partial e-learning
☐ field work</td><td colspan="3">☐ work with mentor
☐ (other)</td></tr>
<tr><td>Student responsibilities</td><td colspan="6"></td></tr>
<tr><td rowspan="6">Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)</td><td>Class attendance</td><td>2</td><td>Research</td><td></td><td>Practical training</td><td></td></tr>
<tr><td>Experimental work</td><td></td><td>Report</td><td></td><td>Individual work</td><td>1</td></tr>
<tr><td>Essay</td><td></td><td>Seminar essay</td><td>2</td><td>(Other)</td><td></td></tr>
<tr><td>Tests</td><td></td><td>Oral exam</td><td></td><td>(Other)</td><td></td></tr>
<tr><td>Written exam</td><td></td><td>Project</td><td></td><td>(Other)</td><td></td></tr>
<tr><td></td><td colspan="6"></td></tr>
<tr><td>Grading and evaluating student work in class and at the final exam</td><td colspan="6">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.</td></tr>
<tr><td rowspan="6">Required literature (available in the library and via other media)</td><td colspan="3">Title</td><td>Number of copies in the library</td><td>Availability via other media</td></tr>
<tr><td colspan="3">Ž. Domazet, L. Krstulović-Opara, Skripta iz Metalnih konstrukcija (in Croatian)</td><td></td><td>E-learning</td></tr>
<tr><td colspan="3">Additional course materials</td><td></td><td>E-learning</td></tr>
<tr><td colspan="3"></td><td></td><td></td></tr>
<tr><td colspan="3"></td><td></td><td></td></tr>
<tr><td colspan="3"></td><td></td><td></td></tr>
<tr><td>Optional literature (at the time of submission of study programme proposal)</td><td colspan="6">- EUROCODE 1
- EUROCODE 3
- B. Androić, D. Dumović, I. Džeba, Metalne konstrukcije I, Institut građevinarstva Hrvatske, Zagreb 1994.
- A. Vukov, Uvod u metalne konstrukcije, Fakultet građevinskih znanosti Sveučilišta u Splitu, Split 1998.</td></tr>
<tr><td>Quality assurance methods that ensure the acquisition of exit competences</td><td colspan="6">- Student evaluations
- Registering student’s attendance to course</td></tr>
<tr><td>Other (as the proposer wishes to add)</td><td colspan="6"></td></tr>
</table>

NAME OF THE COURSE	NOISE AND VIBRATION CONTROL						
Code	FESR16	Year of study	3				
Course teacher	Željan Lozina, Ph.D., Full Professor Damir Sedlar, Ph.D., Assistant Professor	Credits (ECTS)	5				
Associate teachers	Tomac Ivan, Ph.D., Assistant Professor	Type of instruction (number of hours)	L	S	AE	LE	DE
			30	0	15	15	0
Status of the course	Elective	Percentage of application of e-learning	0				

COURSE DESCRIPTION

Course objectives	Training students for: – introduce students to the requirements, principles and methods of noise and vibration control; – provide basic knowledge and understanding of noise and vibration control; – provide the application of this knowledge to simple problems; •
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. Explain free and forced vibrations, 2. Determine the natural frequency of the mechanical system with single degree of freedom, 3. Explain the concepts and phenomena: transferability, excitation imbalance, vibration isolation, 4. Explain the principles of noise isolation, 5. Apply the basic techniques of vibration isolation, 6. Handle with manual measuring instruments and operate with sensors to measure acceleration (accelerometer).

Course content broken down in detail by weekly class schedule (syllabus)	Course content	L or S hours	AE hours
	Single degree of freedom system – free undamped vibration	2	1
	Single degree of freedom system – forced undamped vibration	2	1
	Single degree of freedom system – free damped vibration	2	1
	Single degree of freedom system – forced damped vibration	2	1
	Transmissibility	2	1
	Base and imbalance excitation, vibration isolation	2	1
	Two degree of freedom system	2	1
	Wave equation	2	1
	Fundamentals of noise	2	1
	Humane response to sound	2	1
	Sound source, outdoor sound	2	1
	Indoor sound	2	1
	Sound isolation	2	1
	List of laboratory or design exercises		LE or DE hours
	Introduction to Labview		2

	Single degree of freedom system – free damped vibration	1
	Frequency response function SDOF – shaker	1
	Frequency response function SDOF – unbalance	1
	Single plane balancing	1
	Frequency response function MDOF – shaker	2
	Sound pressure measurement - Labview	1
	Sound pressure measurement – Hand tool	1
	Sound isolation	1
	Reverberation time	1
	Kundt tube	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.	

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. The midterm and final exams are carried out as written tests. The requirement for passing grade is 50 % points on each midterm exam or the final exam. Grade (in percentage) is formed according to the formula: Grade(%) = 0,5 (M1 + M2) • M1, M2 – test results.

Required literature (available in the library and via other media)	**Title**	**Number of copies in the library**	**Availability via other media**
	Ž. Lozina: Lectures, FESB D. Sedlar: Lectures, FESB		Elearning portal
	B.H. Tongue: Principles of vibration, Oxford University press, 1996		

Optional literature (at the time of submission of study programme proposal)	M. Norton, D. Karczub: Fundamentals of Noise and Vibration Analysis for Engineers, Cambridge, 2003.
Quality assurance	- Evaluation of results in accordance with the above learning outcomes

methods that ensure the acquisition of exit competences	- 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	PRODUCTION PREPARING AND PLANNING						
Code	FETR06	Year of study	2.				
Course teacher	Boženko Bilić, Ph. D., Full Professor Nikola Gjeldum, Ph.D., Assistant Professor	Credits (ECTS)	6				
Associate teachers	Nikola Gjeldum, Ph.D. Assistant Professor Ivan Peko, Teaching assistant, Marina Crnjac,. Teaching assistant	Type of instruction (number of hours)	L	S	AE	LE	DE
			45	0	0	0	30
Status of the course	Obligatory	Percentage of application of e-learning	0				

COURSE DESCRIPTION			
Course objectives	• Teach students the basics of manufacturing and production process design. • Teach students the basics of production planning.		
Course enrolment requirements and entry competences required for the course	Completed the first year of vocational study of mechanical engineering or similar studies.		
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	Students will be able to: 1. Explain the characteristics of discrete and continuous material flows in the production process 2. Explain the cycle of production and throughput 3. Classify and explain the components of the processing time 4. Select the optimal raw materials (shape, dimensions and quantity) with respect to the constructional, technological and economic requirements 5. Select machine tools, tools, tool holders, clamping devices and cutting parameters 6. Prepare manufacturing documentation 7. Inventory planning and control 8. Project planning using project network diagrams (network planning techniques) and gantt charts 9. Explain the basic principles for production process design.		
Course content broken down in detail by weekly class schedule (syllabus)	Course content	L hours	AE hours
	Definition of production and manufacturing system. Definition of production and manufacturing process. Fundamentals of material flow in the production process. The basic elements of manufacturing processes (process, composed and group process steps, process step).	3	
	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.	3	
	The scale of business success in the enterprise. Time and motion study: Processing time analysis. Work improvement process. Production cycles.	3	
	Importance of manufacturing process design. The basic principles of manufacturing process design. Analysis of technical drawings (of product).. The choice of raw material. The choice of manufacturing process and machine tools.	3	

	Sequence of manufacturing processes and process steps. Choice of baselines. Choice of tools, tool holders, and cutting parameters.	3	
	The classification and calculation of the processing time (setup time, processing time, auxiliary time and additional time).	2	
	Manufacturing documentation. Calculation of manufacturing costs.	2	
	Errors in manufacturing.	2	
	First midterm exam		
	Group technology: Basic principles of group technology. Basic methods for grouping parts. Machine layouts. Advantages the application of group technology.	3	
	Inventory planning and control.	6	2
	Basic of project management.	3	0
	Basic of plant layout.	6	0
	Second midterm exam		
	List of design exercises		DE hours
	Design example of manufacturing process: Workpiece analysis. Analyze of production lot. Determination of manufacturing processes sequence.		6
	Detailed elaboration of manufacturing process.		6
	Autonomous students work on individual project tasks		8
	Project management: Project network diagrams (network planning techniques) and gantt chart. Project structure analysis - project phases and activities. Project time management using project network diagrams. Project cost management using project network diagrams. Resource planning.		6

Format of instruction	☒ lectures ☐ seminars and workshops ☒ exercises ☐ *on line* in entirety ☐ partial e-learning ☐ field work	☒ independent assignments ☒ multimedia ☐ laboratory ☐ work with mentor ☐ (other)
Student responsibilities	The presence on lectures and exercises in the amount of at least 70 % of the times scheduled. 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	2,5	Research		Practical training	
	Experimental work		Report		Individual work	2,5
	Essay		Seminar essay		Laboratory exercises	0
	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

<table>
<tr><td></td><td colspan="3">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 (%)
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="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>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>*** "Inženjerski priručnik IP4 – treći svezak", pp. 195-236, Školska knjiga, Zagreb, 2002</td><td>1</td><td></td></tr>
<tr><td>I. Veža, B. Bilić, N. Gjeldum, M. Mladineo: Upravljanje projektima (interna skripta), Fakultet elektrotehnike strojarstva i brodogradnje, Split, 2011</td><td></td><td></td></tr>
<tr><td>I. Veža, B. Bilić, B., D. Bajić: Projektiranje proizvodnih sustava (digitalna knjiga), Fakultet elektrotehnike, strojarstva i brodogradnje, Split, 2001.</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</td></tr>
<tr><td>Other (as the proposer wishes to add)</td><td colspan="3"></td></tr>
</table>

NAME OF THE COURSE	PROFESSIONAL TRAINING									
Code	FEYY03	Year of study	3							
Course teacher	Head of the professional training from the Faculty	Credits (ECTS)	10							
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	Mandatory	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: 1. consolidate theoretical knowledge and practical skills in solving problems 2. use literature, databases and other sources of information 3. select appropriate methods and procedures for solving practical problems 4. apply technical knowledge and skills to effectively solve engineering problems 5. 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	7				
	Experimental work		Report		Independent work	2				
	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	RENEWABLE ENERGY SOURCES AND ENVIRONMENT						
Code	FESR 17	Year of study	1				
Course teacher	Prof. dr. sc. Frano Barbir	Credits (ECTS)	5				
Associate teachers	Doc.dr.sc. Ivan Tolj	Type of instruction (number of hours)	L	S	AE	LE	DE
			30		30		
Status of the course	Optional	Percentage of application of e-learning					

COURSE DESCRIPTION

Course objectives	Training students for: • Understanding the problematic of renewable energy sources (RES), their necessity, potential, limits, advantages and drawbacks • Understanding the cutting edge technologies for utilization of RES • Being able to make simple calculations of systems and system components for utilization of RES
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: 10. Understand the need for RES and critically assess their advantages and drawbacks 11. Design and optimize systems, with all the necessary components, for utilizing RES 12. Make a techno-economic analysis of the viability of the proposed systems

Course content broken down in detail by weekly class schedule (syllabus)	Course content	L or S hours	AE hours
	Introduction, definitions, current energy system problems, possible solutions	2	2
	Energy statistics for Croatia and the World	2	2
	Solar energy, Solar geometry	2	2
	Photovoltaics	2	2
	Solar thermal collectors	2	2
	Solar powerplants	2	2
	Economic analysis of RES; multi-criteria analysis	2	2
	First midterm exam	2	2
	Wind energy, wind turbines	2	2
	Hydropower, hydro power plants, water turbines, tidal power, marine current power, wave power	2	2
	Biomass, biofuels, geothermal energy and technologies for its utilization	2	2
	Hydrogen energy technologies	2	2
	Energy return on energy invested (EROI); definition of emergy, emergy analysis	2	2
	Future of RES, 100% supply from RES	2	2

	Seminar presentation	2	2
	List oflaboratoryor designexercises		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)
Studentresponsibilities	To attend at least 70% of all the lectures and exercises	

Screening student work*(name the proportion of ECTS credits for eachactivity 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	1	(Other)	
	Tests	0,5	Oral exam		(Other)	
	Written exam		Project		(Other)	

Grading and evaluating student work in class and at the final exam	During the semester there is one midterm exams and a seminar presentation at the end of the semester. The students that do not pass the midterm exam (or are not happy with their grades) have twofinal exam opportunities at the end of the semester and additional two opportunities at the end of the academic year on pre-decided dates. The midterm exam takes place after the first 7 weeks of lecturing. All the exams are carried out as written tests. The requirement for a passing grade is >49% points. On the first two final exams (at the end of the semester), the students are required to pass only the part which they failed to pass during the semester (midterm exam and/or seminar). On the second two final exams (at the end of the academic year), the students are required to pass the whole exam, regardless of their success during the semester. The final percentage is calculated as follows: Points (%) = (M1+S2)/2; where M1 and S2 are percentage points of the midterm test and the seminar, respectively. The final grade depends on the final percentage and is calculated as follows: 50% to 61% - fair (2), 62% to 74% - good (3), 75% to 87% - very good (4) and 88% to 100% - excellent (5) According to the Article 71 of the Faculty Statute, students are required to attend all forms of lectures and exercises by at least 70%. Students who fail to comply with this regulationwill not be allowed to take the exams.

	Title	Number of copies in the library	Availability via other media
Required literature(available in the library and via other media)	Lj. Majdandžić, Solarni sustavi, Graphis, Zagreb, 2010.		e-learning portal
	F. Barbir, autorizirana predavanja,		e-learning portal
Optional literature (at the time of submission of study programme proposal)	G. Boyle, Renewable Energy, Oxford University Press, 2004. (ilinovijeizdanje)		
Quality assurance methods that ensure the acquisition of exit competences	- Monitoring of students attendance during lectures and exams - Annual analysis of the average exam success - Feedback from students via surveys - Self-evaluation of teachers		
Other (as the proposer wishes to add)			

NAME OF THE COURSE	TECHNICAL DRAWING AND DESCRIPTIVE GEOMETRY 1						
Code	FESR12	Year of study	1				
Course teacher	Željko Domazet, Ph. D., Full Professor	Credits (ECTS)	4				
Associate teachers	Miro Bugarin, Ph. D., Assistant Professor Ivan Špar, Teaching assistant, Dejan Bobić, Teaching assistant, Joško Kunac, Teaching assistant, Petra Bagavac, Teaching assistant	Type of instruction (number of hours)	L	S	AE	LE	DE
			30	0	0	0	15
Status of the course	Obligatory	Percentage of application of e-learning	40%				

COURSE DESCRIPTION

Course objectives	Training students for: • Reading and making technical drawings • Getting knowlage of descriptive geometry • Solving metrics tasks, cross sections and intersections of geometrical bodies
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. Create 2D and 3D techical drawings 2. understand any technical drawing 3. apply general laws of descriptive geometry 4. precisely draw any cross section or intersection of geometrical bodies

Course content broken down in detail by weekly class schedule (syllabus)	Course content	L or S hours	AE hours
	Introduction and general terms	2	
	Ortogonal projection on 2 or 3 planes	2	
	Mutual position between point, line and plane	2	
	Metrics tasks	4	
	Projections of a geom. body	4	
	I. colloquium	2	
	Cross sections of different geometrical bodies	6	
	Intersections of different geometrical bodies	6	
	II. colloquium	2	
	List of constructive exercises		hours
	Metrics tasks		4
	Mutual position between point, line and plane		3
	Cross sections of different geometrical bodies		4
	Intersections of different geometrical bodies		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	Lectures 70%, Exercises 100%	

<table>
<tr><td>responsibilities</td><td colspan="6"></td></tr>
<tr><td rowspan="5">Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)</td><td>Class attendance</td><td>1</td><td>Research</td><td></td><td>Practical training</td><td></td></tr>
<tr><td>Experimental work</td><td></td><td>Report</td><td></td><td>Individual work</td><td>1</td></tr>
<tr><td>Essay</td><td></td><td>Seminar essay</td><td></td><td>Constructive tasks</td><td>1</td></tr>
<tr><td>Tests</td><td>0.5</td><td>Oral exam</td><td></td><td>(Other)</td><td></td></tr>
<tr><td>Written exam</td><td>0.5</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">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,practical.
Mode of exam: written form.</td></tr>
<tr><td rowspan="6">Required literature (available in the library and via other media)</td><td colspan="3">Title</td><td>Number of copies in the library</td><td>Availability via other media</td></tr>
<tr><td colspan="3">Ž. Domazet, M. Bugarin „INŽENJERSKA GRAFIKA“-materials of lectures, FESB.</td><td></td><td>E-learning</td></tr>
<tr><td colspan="3">Ksenija Horvatić-Baldasar, Ivanka Babić „NACRTNA GEOMETRIJA“, SAND d.o.o. Zagreb</td><td>5</td><td>Library FESB</td></tr>
<tr><td colspan="3"></td><td></td><td></td></tr>
<tr><td colspan="3"></td><td></td><td></td></tr>
<tr><td colspan="3"></td><td></td><td></td></tr>
<tr><td>Optional literature (at the time of submission of study programme proposal)</td><td colspan="6">- M. Opalić, M. Kljajin, S. Sebastijanović „TEHNIČKO CRTANJE“ Zrinski d.d. Zagreb
- Ivan Prebil „OPISNA GEOMETRIJA“ fakulteta za strojništvo, Ljubljana</td></tr>
<tr><td>Quality assurance methods that ensure the acquisition of exit competences</td><td colspan="6">- Student evaluations
- Registering student’s attendance to course</td></tr>
<tr><td>Other (as the proposer wishes to add)</td><td colspan="6"></td></tr>
</table>

NAME OF THE COURSE	TECHNICAL DRAWING AND DESCRIPTIVE GEOMETRY 2						
Code	FESR18	Year of study	1				
Course teacher	Tonči Piršić, Ph. D. Associate Professor	Credits (ECTS)	4				
Associate teachers	Petra Bagavac, Teaching assistant, Miro Bugarin, Ph.D., AssistantProfessor Ivan Špar, Teaching assistant,Joško Kunac, Teaching assistant, Dejan Bobić, 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	40%				

COURSE DESCRIPTION

Course objectives	Training students for: •		
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. Ability of drawing technical drawings both by hand and by using the computer. Understanding of basis principles of engineering design.		
Course content broken down in detail by weekly class schedule (syllabus)	Course content	L or S hours	AE hours
	Types of drawings. Drawing formats.	2	2
	Part lists. Scales. Line types and purposes. Layers. Prospective views. Isometric view. Orthogonal view.	4	4
	Cross-sections. Hatching. Reducing the number of views. Simplifications in drawings.	4	4
	Drawing of screw threads. Schematic representation of threads. Dimensioning: line, radius, diameter, arc.	4	4
	Dimensioning of cone and inclination. Dimensioning styles. Surface roughness. Parameters of surface roughness, symbols and application.	4	4
	Blocks and their properties. Using the blocks. Attributes. Prototype drawing. Tolerances and fits. Fit types.	6	4
	ISO system of fits. Geometric tolerances. Basic of AutoCAD.	2	6
	List of laboratory or design exercises		LE or DE hours
Format of instruction	☒ lectures	☐ independent assignments	

<table>
<tr><td></td><td colspan="3">☐ seminars and workshops
☒exercises
☐ on line in entirety
☐ partial e-learning
☐ field work</td><td colspan="3">☐ multimedia
☐ laboratory
☐ work with mentor
☐ (other)</td></tr>
<tr><td>Student responsibilities</td><td colspan="6">The presence on lectures in the amount of at least 70 % of the times scheduled. Performed all required laboratory exercises.</td></tr>
<tr><td rowspan="5">Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)</td><td>Class attendance</td><td>1</td><td>Research</td><td></td><td>Practical training</td><td></td></tr>
<tr><td>Experimental work</td><td></td><td>Report</td><td></td><td>(Other)</td><td></td></tr>
<tr><td>Essay</td><td></td><td>Seminar essay</td><td></td><td>(Other)</td><td></td></tr>
<tr><td>Tests</td><td>1</td><td>Oral exam</td><td></td><td>(Other)</td><td></td></tr>
<tr><td>Written exam</td><td>2</td><td>Project</td><td></td><td>(Other)</td><td></td></tr>
<tr><td>Grading and evaluating student work in class and at the final exam</td><td colspan="6">There are two midterms and final exams. The first midterm exam is after 7 weeks of lecturing and the second one is after the next 6 weeks.</td></tr>
<tr><td rowspan="6">Required literature (available in the library and via other media)</td><td colspan="3">Title</td><td>Number of copies in the library</td><td>Availability via other media</td></tr>
<tr><td colspan="3">1. T. Piršić: "Tehničko crtanje", FESB - Split, 2010.</td><td></td><td></td></tr>
<tr><td colspan="3">2. T. Piršić: "AutoCAD u strojarstvu", FESB - Split, 2010.</td><td></td><td></td></tr>
<tr><td colspan="3">3. Grupa autora: Inženjerski Priručnik, IP1 – Temelji inženjerskih znanja (Chapter) “Inženjerska grafika”), Školska knjiga, Zagreb, 1999.</td><td></td><td></td></tr>
<tr><td colspan="3">4. M. Opalić, M. Kljajin, S. Sebastijanović: “Tehničko crtanje”, Zrinski d. d. Čakovec, 2003.</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">Ć. Koludrović: “Tehničko crtanje u slici”, Naučna knjiga, Beograd, 1985.</td></tr>
<tr><td>Quality assurance methods that ensure the acquisition of exit competences</td><td colspan="6">– Lectures responsible for the same subject area collaborate closely and monitor each other's work. Occassional class observations and appraisal by Head of Department</td></tr>
<tr><td>Other (as the proposer wishes to add)</td><td colspan="6"></td></tr>
</table>

<table>
<tr><td>NAME OF THE COURSE</td><td colspan="6">THERMAL AND HYDRAULIC MACHINES</td></tr>
<tr><td>Code</td><td>FESR22</td><td>Year of study</td><td colspan="4">2.</td></tr>
<tr><td>Course teacher</td><td>Gojmir Radica, Ph. D., Full Professor</td><td>Credits (ECTS)</td><td colspan="4">7</td></tr>
<tr><td rowspan="2">Associate teachers</td><td rowspan="2">Dario Bezmalinović, Ph. D., Teaching assistant Ivan Tolj, Ph. D.,Teaching assistant, Tino Sumić, 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>30</td><td>15</td><td></td></tr>
<tr><td>Status of the course</td><td>Obligatory</td><td>Percentage of application of e-learning</td><td colspan="4">0</td></tr>
<tr><td colspan="7">COURSE DESCRIPTION</td></tr>
<tr><td>Course objectives</td><td colspan="6">Training students for:
understanding of basic principles of reciprocating engines, compressors, pumps and fans,
setting up and solving thermodynamic, fluid mechanic and design parameters of Thermal and hydraulic machines,
permanent adoption and deepening of knowledge in the field of thermal and hydraulic machines.</td></tr>
<tr><td>Course enrolment requirements and entry competences required for the course</td><td colspan="6">Thermodynamics, Fluid Mechanics</td></tr>
<tr><td>Learning outcomes expected at the level of the course (4 to 10 learning outcomes)</td><td colspan="6">Students will be able to:
- identify different types of thermal and hydraulic machines,
- calculate basic design and performance parameters of internal combustion engines, compressors, pumps,
- analyze the energy transformation in thermal machines and its dependence on basic working and dimensional characteristics of the process,
- select a heat engine, compressor or pump for the particular system based on its energy characteristics,
- analyze of pump parameters and pipe installation in pump plants,
- diagnose conditions of thermal or hydraulic machine.</td></tr>
<tr><td rowspan="8">Course content broken down in detail by weekly class schedule (syllabus)</td><td colspan="3">Course content</td><td>L or S hours</td><td colspan="2">AE hours</td></tr>
<tr><td colspan="3">Introduction to thermal machines. Brief history of thermal machines. Internal combustion engines definition. Description of system and engine parts.</td><td>3</td><td colspan="2">2</td></tr>
<tr><td colspan="3">Design and operating parameters. Brake power and torque. Indicated work. Mechanical efficiency.</td><td>3</td><td colspan="2">2</td></tr>
<tr><td colspan="3">Mean effective pressure. Specific fuel consumption. Air excess ratio. Volumetric efficiency. Emissions. Power. Torque..</td><td>3</td><td colspan="2">2</td></tr>
<tr><td colspan="3">IC Engine working cycles. Otto cycle. Diesel cycle. Sabathé cycle. Two stroke. Four stroke.</td><td>3</td><td colspan="2">2</td></tr>
<tr><td colspan="3">Inlet and exhaust systems. Diesel fuel systems. Direct and indirect injection systems. Fuel characteristics.</td><td>3</td><td colspan="2">2</td></tr>
<tr><td colspan="3">Otto engines - fuel systems. Gas engines. Formation of</td><td>3</td><td colspan="2">2</td></tr>
</table>

	mixture.		
	Classification and application of compressors. Thermodynamic fundamentals of single- and multi-stage compressor operation. Compressor power consumption.	3	2
	Reciprocating compressors, design and constructive features. Calculation and design of single- and multi-stage reciprocating compressors. Dynamics of a reciprocating mechanism.	3	2
	Suction and discharge valves of reciprocating compressors. Ideal and actual capacity. Capacity control. Efficiency.Lubrication.	3	2
	Screw compressors, constructive features, capacities and control. Scroll compressors, constructive features capacities and control. Vane compressors. Turbo compressors, constructive features, performance and control.Compressors application.	3	2
	Classification and application of pumps. Piston pumps.	3	2
	Fluid and energy flow through pump. Suction limits of piston pumps. Centrifugal turbo pumps. Basic fluid flow laws application.	3	2
	Main construction elements of pump. Multi stage centrifugal pumps. Characteristics of pumps installed in pipe line. Cavitations and how to avoid it. Flow regulation in centrifugal pumps. Pump plant and pump in work. Centrifugal fans. Axial turbo pumps and fans. Gear pumps, work characteristics	3	2
	List of laboratory or design exercises		LE or DE hours
	Engine parts, technical specification.		2
	Engine constructive and operating parameters.		2
	Brake power and torque. Indicated work. Efficiency. Fuel consumption. Maintenance and diagnostic. Testing.		3
	Compressor parts, technical specification, characteristics.		3
	Characteristics of pumps installed in pipe line		3

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

Screening student work *(name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)*						
	Class attendance	3	Research		Practical training	
	Experimental work		Report		(Other)	3,7
	Essay		Seminar essay		(Other)	
	Tests	0,2	Oral exam		(Other)	
	Written exam	0,1	Project		(Other)	

<table>
<tr><td>Grading and evaluating student work in class and at the final exam</td><td colspan="3">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 test-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.</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 i Toplinski i hidraulički 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>Ninić Neven: Osnovi pumpi i ventilatora, FESB Interna skripta, Split, 1994</td><td>5</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.

6. Pilić-Rabadan Ljiljana: Vodne turbine i pumpe, vjetroturbine, FESB Split, 2000.</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	THERMODYNAMICS						
Code	FESR20	Year of study	3				
Course teacher	Frano Barbir, Ph. D., Full Professor	Credits (ECTS)	6				
Associate teachers	Ivan Tolj, Ph. D., Teaching assistant	Type of instruction (number of hours)	L	S	AE	LE	DE
			45	0	15	15	0
Status of the course	Obligatory	Percentage of application of e-learning					

COURSE DESCRIPTION

Course objectives	Training students for: • understanding of the basic concepts and laws of thermodynamics • application of the concepts and laws of thermodynamics to energy processes and systems			
Course enrolment requirements and entry competences required for the course	Mathematics 2			
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	Students will be able to: 1. explain the basic concepts and laws of thermodynamics 2. apply the concepts and laws of thermodynamics to the different types of a simple technical energy process 3. calculate the mass balance and simple balance of different types of energy flows 4. calculate the efficiency of the process and energy systems 5. link effects of all studied processes by changes in the environment			
Course content broken down in detail by weekly class schedule (syllabus)	Course content	L or S hours	AE hours	LE hours
	The subject of thermodynamics, two external impacts (work, heat) and pressure, volume and temperature as state functions. State equation of ideal gas.	3	2	1
	Two ways to express quantity of the substances. Mixture of ideal gases. Thermal expansion of solids and liquids.	3	2	1
	The first law of thermodynamics, internal energy and its connection with measurable state functions. Caloric state equation of ideal gas. Application of the first law on ideal gas.	3	2	1
	Isobaric, isochoric, isothermal and adiabatic processes. Polytropic processes. Cycle processes. Otto, Diesel and Carnot cycle. Internal and external non-equilibrium processes.	3	2	1
	The second law of thermodynamics. Two consequences of the second law. The analytical expression of the second law for equilibrium processes. Connection of entropy with measurable state functions of ideal gases. The analytical expression of the second law of nonequilibrium processes.	3	2	1
	Flow processes. Enthalpy and technical work. The first law of thermodynamics for flow processes. The term for steady work flow process. Damping. Typical technical flow processes with heat exchange without work. The processes with work and without heat.	3	2	1
	Real gases – p-V diagrams instead of the state equation	3	2	1

	Molière h-s diagram and T-s diagram. Using charts and tables. Rankine Clausius cycle with and without steam overheating. The concept of regeneration, efficiency and simplified schemes of steam - power plants.			
	Knowledge test – first midterm exam	3		
	Cooling power plants cycles and coefficient of performance. The main properties of refrigerants. Heat pumps.	3	2	1
	Humid air and h-x diagram. Humid air typical processes.	3	2	1
	Fuel combustion. Numerical characterization of the fuel and combustion: heat of combustion, adiabatic combustion temperature and ignition temperature of the fuel. Required air amount. Determination of air excess from the composition of the combustion products.	3	2	1
	Heat transfer: three different mechanisms. Heat conduction.	3	2	1
	Convective heat transfer. The physical mechanism of convection, heat transfer coefficient and Nu number. The process of determining the heat transfer coefficient	3	2	1
	Heat transfer by radiation. The term black body and "black" radiation. Overall heat transfer coefficient, ribs surface. Heat exchangers. Heat exchanger calculations.	3	2	1
	Knowledge test – second midterm exam	3		

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

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	1	Oral exam		(Other)	
	Written exam		Project		(Other)	

Grading and evaluating student work in class and at the final exam	During semester there are two midterm exams. Upon completion of the semester the first and second final exam are held as well as corrective and commission exams. The first midterm exam is after 7 weeks of lecturing and the second one is after the next 6 weeks. The midterms are carried out as written tests. The requirement for passing grade is 50 % points on each midterm exam. Grade (in percentage) is formed according to the formula: Grade(%) = (M1+M2)/2 M1, M2 – test results The final grade is determined by applying an absolute way of evaluation. The final grade is determined according to the points as follows: from 50% to 61% of the points score mark (2), from 62% to 74% mark (3), from 75% to 87% of the points mark (4) , from 88% to 100% mark (5)

<table>
<tr><td></td><td colspan="3">Under Article 71 of the Faculty Statute, the student is required to participate in all forms of teaching and attend lectures and exercises at least 70%. If students do not meet these requirements they will not be allowed to write exams.</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>O. Fabris, Osnove Inženjerske termodinamike, Pomorski fakultet Dubrovnik, 1994</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">6. I. Ninić, Uvod u termodinamiku i njene tehničke primjene, Sveučilište u Splitu, 2007.
7. F. Bošnjaković, Nauka o toplini I dio, Školska knjiga Zagreb, 1976.</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	TRANSPORT IN INDUSTRY						
Code	FESR24	Year of study	2				
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	0	0	30
Status of the course	Elective	Percentage of application of e-learning	40%				

COURSE DESCRIPTION

Course objectives	Training students for: understanding and application of basic principles of construction of transport systems. •		
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: 1. 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	1	Research		Practical training	
	Experimental work		Report		(Other)	
	Essay		Seminar essay		(Other)	
	Tests	2	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)	

NAME OF THE COURSE	TRIBOLOGY BASICS							
Code	FETR15	Year of study	3					
Course teacher	Dražen Živković, Ph. D., Full Professor	Credits (ECTS)	5					
Associate teachers	Zvonimir Dadić, 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: - Introduction to basic tribological wear mechanisms, - The basic types of materials wear and constructions wear, - The basic methods of wear control.		
Course enrolment requirements and entry competences required for the course	Passed exam - Materials		
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	Students will be able to: - Identify the fundamental tribological mechanisms - Describe the types of tribological wear - Characterize tribological corrosion mechanisms - Collect data to analyze the tribological wear - Choosing the type of lubricant due to the mechanisms of wear and tear		
Course content broken down in detail by weekly class schedule (syllabus)	Course content	L hours	LE hours
	Introduction to tribology, the importance of tribology in industrial production	2	0
	Surfaces: physical and chemical properties of surface	2	0
	Surface (conformal) contact, concentrated (conforming) contact	2	0
	The wear mechanism I: abrasion, abrasion resistance	2	0
	The wear mechanism II: adhesive wear, adhesive wear resistance	2	0
	The wear mechanism III: surface fatigue wear, resistance	2	0
	The wear mechanisms IV: tribo-corrosion, resistance	2	0
	First midterm exam		
	Wear types I: slip wear, rolling wear, tfatigue wear, fretting	2	0
	Wear types II: abrasive wear, erosion particles wear, erosion, cavitation	2	0
	Lubricants, the role of lubricant in tribological system	2	0
	Lubrication types I: boundary lubrication, mixed lubrication	2	0
	Lubrication types II: hydrodynamic lubrication, elastic-hydrodynamic lubrication,	2	0
	Identification of the basic tribological systems in metal processing	2	0
	Second midterm exam		
	List of laboratory or design exercises		AE
	Tribological losses in the machines maintenance.		2
	Tribological losses on tools and devices		2
	The wear resistant materials selection		2
	Evaluation of the relative resistance of materials to abrasive wear mechanism		2

	Tribological system cereals - pipe conveyors	2
	Tribological processes at the basic elements of the cement production plant	2
	New surface protection procedures	2
	First midterm exam	
	Wear testing methodology for dynamic contact pairs type metal-polymer	2
	Test methods for sliding wear	2
	Tribological mechanisms in large low-speed diesel engine	2
	Exam preparation	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 in lectures and exercises in the amount of at least 70%. 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		Self-directed learning	3,0
	Essay		Seminar essay		Laboratory exercises	1,0
	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. Usually it consists of three tasks. The requirements for a positive evaluation are: positive assessment of 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) 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 written exam consists of six tasks. The exam lasts 90 minutes.

Required literature (available in the library and via other media)	**Title**	**Number of copies in the library**	**Availability via other media**
	D. Živković, the author's lecture, FESB		E-learning

Optional literature (at the time of submission of study programme proposal)	Ivušić, V. “Tribologija”, HDMT, Zagreb, 1998
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	WELDING AND SIMILAR TREATMENTS						
Code	FETR02	Year of study	1				
Course teacher	Nedjeljko Mišina, Ph.D., Full Professor	Credits (ECTS)	5				
Associate teachers	Zvonimir Dadić, Teaching assistant	Type of instruction (number of hours)	L	S	AE	LE	DE
			45			15	
Status of the course	Obligatory	Percentage of application of e-learning	0				

COURSE DESCRIPTION

Course objectives	Training students to: - Understand the physical changes in welding, brazing and soldering, bonding,metallisation and thermal cutting of metal. - Explain of the basic welding processes and their application. - Accept the standards in welding, certification of the welding procedures and welders.		
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: - Select the appropriate welding process, filler material and welding parameters, - Develop welding technology, - Calculate the preheating temperature of the welded joint, - Propose measures to reduce deformations and residual stresses in welded joints,		
Course content broken down in detail by weekly class schedule (syllabus)	Course content	L hours	AE hours
	Introduction. Basic terms. Welding processes. The properties of welded joints.	3	0
	Power sources for welding.	3	0
	Deformations and residual stresses of welded joints	3	0
	Electric arc. Metal transfer in the electric arc.	3	0
	SMAW welding process	3	0
	TIG welding process. Plasma. MIG / MAG welding process	3	0
	EPP welding process. Resistance welding	3	0
	First midterm exam		
	Special welding processes	3	0
	Gas welding. Welding devices. Robots.	3	0
	Welding defects. Brazing and soldering.	3	0
	Gas and plasma cutting. Oxyarc. Arcair.	3	0
	Certification of the welding procedures and welders. Regulations in welding. Welding technology	3	0
	Metallurgical welding. Preheating welds. Weldability of: carbon steels, irons, Al and Ti alloys, stainless steels.	3	0

	Second midterm exam	
	List of laboratory or design exercises	LE
	Basic concepts of welding. The division of welding processes.	3
	The impact of coated electrodes on the stability of the electric arc. SMAW welding process. MIG / MAG welding process	3
	EPP welding process. EO welding. Friction welding.	3
	TIG welding process. Gas welding. Brazing and soldering.	3
	Gas and plasma cutting. Oxyarc. Arcair. Metallisation	3
	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 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		Self-directed learning	2,5
	Essay		Seminar essay		Laboratory exercises	1,0
	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 laboratory 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) 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.

Required literature (available in the library and via other media)	**Title**	**Number of copies in the library**	**Availability via other media**
	N. Mišina: the author's lecture, FESB		E-learning

Optional literature (at the time of submission of study programme proposal)	- S. Kralj, Š. Andrić: Zavarivanje i srodni postupci, FSB, Zagreb, 1999. - M. Gojić: Tehnika spajanja i razdvajanja materijala, Metalurški fakultet , Sisak, 2003.		
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	WIND FARMS AND HYBRID ENERGY SYSTEMS						
Code	FESR25	Year of study	3.				
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: - specify the most important widely accepted renewable energy sources, - enumerate and explain the modes of renewable energy converter application, - categorize and shape wind turbine and hybrid energy system for a wide applications.		
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: - explain the role of wind, solar, biomass and other relevant renewable energy sources, - to interpret the role of wind turbines and hybrid energy systems in energy supply, - explain ways of storing energy, - sort out the basic parameters for dimensioning and calculating the system parts, - identify and discern the effects on the production and use of energy systems.		
Course content broken down in detail by weekly class schedule (syllabus)	Course content	L or S hours	AE hours
	Introduction and wind farms and hybrid energy systems.	2	2
	Basics of wind, solar energy, biomass, geothermal energy and hydropower.	2	2
	Broader and narrower term of wind farms and hybrid energy systems for the conversion of energy from renewable sources.	2	2
	The basic parts and division.	2	2
	Status and role of wind feam and hybrid energy system in energy supply.	2	2
	Basic knowledge of hybrid and standalone systems, energy, manufacturing and transport systems that use them.	2	2
	Availability and transport of energy in the past and today, the use of multiple types of energy in one place.	2	2
	Storing energy in wind farms and hybrid energy systems.	2	2
	Movable and fixed hybrid energy systems and development.	2	2
	Energy resources for the effective use of these systems.	2	2
	Energy needs, potentials and dimensioning.	2	2
	Examples of application to smaller systems.	2	2
	Examples of applications to large systems.	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.: Hibridni energetski sustavi, authorized lectures, FESB		e-learning portal
	- Kulišić, P., Novi izvori energije, Školska knjiga, Zagreb, 1991.		book
	- Kulišić, P.; Vuletin, J.; Zulim, I.: Sunčane ćelije, Školska knjiga, Zagreb, 1994.		book
	- Matić, M.: Gospodarenje energijom, Školska knjiga, Zagreb, 1995.		book

Optional literature (at the time of submission of study programme proposal)	- Masters, G.M.: Renewable and Efficient Electric Power Systems, Wiley-IEEE Press, 2004.
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

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. first phase, 2008. second phase
Total square area in m^2	29.477

3.2. List of teachers and associate teachers

Course	Teachers and associate teachers
Applied Mathematics	Ivančica Mirošević, Lecturer Lea Dujić, Teaching assistant
Computer Aided Design	Gojko Magazinović, Ph. D., Full Professor Ivan Pivac, Teaching assistant.
Computer Aided Manufacturing	Dražen Bajić, Ph. D., Full Professor Sonja Jozić, Ph.D., Assistant Professor Mario Veić, Teaching assistant
Economics and Production Organization	Ivica Veža, Ph. D., Full Professor Marko Mladineo, Ph. D., Teaching assistant
Electrical Engineering	Ivica Jurić-Grgić, Ph. D., Associate Professor Nedjeljka Grulović – Plavljanić, Senior Lecturer
Energy Efficiency in Buildings	Sandro Nižetić, Ph. D., Full Professor Ivan Tolj, Ph. D., Teaching assistant Dario Bezmalinović, Ph. D., Teaching assistant
Engineering Maintenance	Jani Barle, Ph.D., Full Professor Stipe Perišić, Teaching assistant
Engineering Mechanics 1	Vedrana Cvitanić, Ph. D., Associate Professor Marko Vukasović, Ph. D., Teaching Assistant, Branka Bužančić Primorac, Ph. D., Teaching assistant, Maja Kovačić, Teaching assistant
Engineering Mechanics 2	Željan Lozina, Ph. D. Full Professor, Damir Sedlar, Ph.D., AssistantProfessor
English Language 1	Mira Braović Plavša Senior Lecturer
English Language 2	Mira Braović Plavša Senior Lecturer
Fluid Mechanics	Branko Klarin, Ph. D., Full Professor Maja Zore, Teaching assistant
Heating and Air Conditioning	Sandro Nižetić, Ph. D., Associate Professor Ivan Tolj, Ph. D., Teaching assistant

	Dario Bezmalinović, Ph. D., Teaching assistant
Hydraulics and Pneumatics	Jani Barle, Ph.D., Full Professor Alen Kovač, Teaching assistant
Industry Processes Automatic Control	Jadranka Marasović, Ph.D.., Full Professor, Jani Barle, Ph.D., Full Professor Ivan Jadrić, Teaching Assistant
Introduction to Computer Applications	Goran Petrović, Ph.D., Associate Professor Josip Vasilj, Ph. D., Teaching assistant
Introduction to Entrepreneurship	Marija Šiško Kuliš, Ph. D., Associate Professor
Machine Elements 1	Srdjan Podrug, Ph.D. Full Professor Damir Jelaska, Ph. D. Full Professor, Milan Perkušić, Teaching assistant, Filip Grubišić-Čabo, Teaching assistant
Machine Elements 2	Srdjan Podrug, Ph.D. Full Professor Damir Jelaska, Ph. D. Full Professor, Milan Perkušić, Teaching assistant
Machining and Machine Tools	Dražen Bajić, Ph. D., Full Professor Sonja Jozić, Ph. D., Assistant Professor Mario Veić, Teaching assistant
Marine Machinery and Devices	Gojmir Radica, Ph. D., Full Professor Dario Bezmalinović, Ph. D., Teaching assistant Ivan Tolj, Ph. D., Teaching assistant Tino Sumić, Teaching assistant
Materials	Nedjeljko Mišina, Ph. D., Full Professor, Dražen Živković, Ph. D., Full Professor Nikša Čatipović, Teaching assistant, Zvonimir Dadić, Teaching assistant
Mathematics	Ivančica Mirošević, Lecturer, Lea Dujić, Teaching assistant, Marija Čatipović, Teaching assistant Marina Mandić, Teaching assistant
Measurements in Engineering	Frano Barbir, Ph.D.,Full Professor Boženko Bilić, Ph.D.,Full Professor Jakša Galić, Teaching assistant, Ivan Tolj, Ph.D., Teaching assistant
Mechanics of Materials	Vedrana Cvitanić, Ph. D., Associate Professor Marko Vukasović, Ph. D., Teaching assistant Maja Kovačić, Teaching assistant
Metal Forming by Deformation	Branimir Lela, Ph. D., Assistent Professor Jure Krolo, Teaching assistant
Metal Structures Design	Lovre Krstulović-Opara, Ph. D., Full Professor
Noise and Vibration Control	Željan Lozina, Ph.D., Full Professor Damir Sedlar, Ph.D., Assistant Professor Tomac Ivan, Ph.D., Assistant Professor

Production Preparing and Planning	Boženko Bilić, Ph. D., Full Professor Nikola Gjeldum, Ph.D. Assistant Professor Ivan Peko, Teaching assistant, Marina Crnjac,. Teaching assistant
Professional Training	Head of the professional training from the Faculty Head of the professional training from the private institution
Renewable Energy Sources and Environment	Frano Barbir, Ph. D., Full Professor Ivan Tolj, Ph. D., Assitant Professor
Technical Drawing and Descriptive Geometry 1	Željko Domazet, Ph. D., Full Professor Miro Bugarin, Ph. D., Assistant Professor Ivan Špar, Teaching assistant, Dejan Bobić, Teaching assistant, Joško Kunac, Teaching assistant, Petra Bagavac, Teaching assistant
Technical Drawing and Descriptive Geometry 2	Tonči Piršić, Ph. D. Associate Professor, Petra Bagavac, Teaching assistant, Miro Bugarin, Ph.D., AssistantProfessor, Ivan Špar, Teaching assistant,Joško Kunac, Teaching assistant, Dejan Bobić, Teaching assistant
Thermal and Hydraulic Machines	Gojmir Radica, Ph. D., Full Professor Dario Bezmalinović, Ph. D., Teaching assistant Ivan Tolj, Ph. D.,Teaching assistant, Tino Sumić, Teaching assistant
Thermodynamics	Frano Barbir, Ph. D., Full Professor Ivan Tolj, Ph. D., Teaching assistant
Transport in Industry	Tonči Piršić, Ph. D., Associate Professor
Tribology Basics	Dražen Živković, Ph. D., Full Professor Zvonimir Dadić, Teaching assistant
Welding and Similar Treatments	Nedjeljko Mišina, Ph.D., Full Professor Zvonimir Dadić, Teaching assistant
Wind Farms and Hybrid Energy Systems	Branko Klarin, Ph. D., Full Professor Goran Gašparović, Teaching Assistant

3.3. Curriculum vitae of the course teacher

First and last name and title of teacher	**Dražen Bajić, Ph. D., Full Professor**
The course he/she teaches in the proposed study programme	Machining and machine tools Computer aided manufacturing
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	**Undergraduate study:** 1. Technology 2 (150)

title of course, study programme where it is/was offered, and level of study programme)	2. Technology 2 (130) **Graduate study:** 1. Computer aided manufacturing (261,262,263) 2. Machine tools (261, 263) 3. Machine tools and systems (270) 4. Sustainable production (272) **Professional study:** 1. 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	**Frano Barbir, Ph. D., Full Professor**
The courses he/she teaches in the proposed study programme	Thermodynamics Measurements in Engineering
GENERAL INFORMATION ON COURSE TEACHER	
Address	R. Boskovica 32
Telephone number	+385 21 305 953
E-mail address	fbarbir@fesb.hr
Personal web page	www.fesb.hr/~fbarbir
Year of birth	1954
Scientist ID	124283
Research or art rank, and date of last rank appointment	Scientific advisor, 05.07.2006.
Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment	Full tenured professor 26.09.2011.
Area and field of election into research or art rank	Area of technical sciences, field mechanical engineering
INFORMATION ON CURRENT EMPLOYMENT	
Institution where employed	Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture, University of Split
Date of employment	01.10.2006
Name of position (professor, researcher, associate teacher, etc.)	Professor
Field of research	Thermodynamics, Renewable energy sources, hydrogen technologies
Function	Chair of Thermodynamics, Thermo-technics and heat engines
INFORMATION ON EDUCATION – Highest degree earned	
Degree	PhD in Mechanical Engineering
Institution	University of Miami
Place	Coral Gables, FL, SAD
Date	18. December 1992.
INFORMATION ON ADDITIONAL TRAINING	
Year	1995
Place	Cleveland
Institution	Case Western Reserve University
Field of training	Electrochemical measurements
MOTHER TONGUE AND FOREIGN LANGUAGES	
Mother tongue	Croatian
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	English – 5
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	Italian – 2
COMPETENCES FOR THE COURSE	
Earlier experience as course teacher of similar courses (name title of course, study programme where it is/was offered, and level of study programme)	1. Special Topics in Mechanical Engineering: Fuel Cells Engineering, University of Connecticut (2002 - 2005) diplomski i poslijediplomski studij 2. Special Topics in Mechanical Engineering: Fuel Cells Modeling, University of Wyoming (2012 - 2013) diplomski i poslijediplomski studij
Authorship of university/faculty textbooks in the field of the course	1. F. Barbir, PEM Fuel Cells: Theory and Practice, 2nd edition, Elsevier/Academic Press, Burlington, 2013.

Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)	1. D. Bezmalinović, B. Šimić, F. Barbir, Characterization of PEM fuel cell degradation by polarization change curves, *Journal of Power Sources*, Vol. 294, (2015) pp. 82-87 2. E. Özden, I. Tolj, F. Barbir, Designing heat exchanger with variable surface area for passive cooling of PEM fuel cell, J. Appl. Thermal Eng., Vol. 51, No. 1–2, (2013), pp. 1339-1344 3. D. Bezmalinovic, F.Barbir I. Tolj, Techno-economic analysis of PEM fuel cells role in photovoltaic-based systems for the remote base stations, Int. J. Hydrogen Energy, Vol. 38, No. 1, (2013) pp. 417-425. 4. I. Tolj, D. Bezmalinovic, F.Barbir, Maintaining desired level of relative humidity throughout a fuel cell with spatially variable heat removal rates, Int. Journal Hydrogen Energy, Vol. 36, No. 20, (2011) pp. 13105-13113. 5. O. Atlam, F. Barbir, D. Bezmalinovic, A Method for Optimal Sizing of an Electrolyzer Directly Connected to a PV Module, International Journal of Hydrogen Energy Vol. 36, No. 12, (2011) pp. 7012-7018.
Professional and scholarly articles published in the last five years in subjects of teaching methodology and teaching quality (5 works at most)	
Professional, science and artistic projects in the field of the course carried out in the last five years (5 at most)	• Project Leader, R&D of Hydrogen Energy System in Conjunction with Renewable Energy Sources, European Regional Development Fund through Central Agency for Contracting and Financing of EU projects (2014-2016) • Project Leader, Water and Heat Management and Durability of PEM Fuel Cells), Croatian Science Foundation, 2015-2018 • Work Package Leader: System Automation of PEMFCs with Prognostics and Health management for Improved Reliability and Economy (SAPPHIRE), project leader: SINTEF, Norway, project financed by EC FCH Joint Undertaking, (FCH-JU), 2013-2016 • Work Package Leader: Development of Guidance Manual for LCA Application to Fuel Cells and Hydrogen Technologies, H2FC-LCA HyGuide, Project Leader: ENEA Italy, project financed by EC EC FCH Joint Undertaking, (FCH-JU), 2010-2011 • Project Leader: Passive fuel cells with oxygen supply from air by natural convection, Ministry of Science, Education and Sports, 2007-2013
The name of the programme and the volume in which the main teacher passed exams in/acquired the methodological-psychological-didactic-pedagogical group of competences?-pedagoške kompetencije?	„Training for teachers and administrative staff“ as a part of EU project ME4CatalOgue (Mechanical Engineering for Catalogue) 2013-2015
PRIZES AND AWARDS, STUDENT EVALUATION	
Prizes and awards for teaching and scholarly/artistic work	• National annual award for science in technical sciences, 2012 • University of Split plaque for exceptional contribution to University development through outstanding scientific, teaching and professional work, 2012

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)	• FESB, Heat and Mass Transfer, 4.5/5 • University of Wyoming, Excellent, No grades- descriptive evaluation, Fuel Cell Engineering course, 2012,

First and last name and title of teacher	**Jani Barle, Ph. D., Full Professor**
The course he/she teaches in the proposed study programme	- Engineering maintenance - Hydraulic and pneumatics - Industry processes automatic control
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: - Product life management (FETM06) Doctorate degree study: - Experimental methods (FETU24) - Reliability engineering (FETU14)
Authorship of university/faculty textbooks in the field of the course	Barle, J.: Hydraulics and pneumatics, (student handbook and workbook in Croatian: *Hidraulika i pneumatika*), FESB, Split, 2010. 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	Production Preparing and Planning Measurements in Engineering
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. Veža, I., Bilić, B., Gjeldum, N., Mladineo, M., *Upravljanje projektima* (interna skripta, ISBN 978-953-290-030-9), Fakultet elektrotehnike, strojarstva i brodogradnje, Split, 2011. 2. Veža, I., Bilić, B., Bajić, D., *Projektiranje proizvodnih sutava*, (e-udžbenik, recenzent prof. dr. sc. Roko Cebalo), Split, 2001. 3. Bilić, B., *Teorija i tehnika mjerenja – Mjerenje oblika i izmjera* (interna skripta - udžbenik, ISBN 978-953-6114-99-3), Fakultet elektrotehnike, strojarstva i brodogradnje, Split, 2007.
Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)	1. 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, DOI: 10.1080/0951192X.2014.900868 2. Gjeldum, N., Veža, I., Bilić, B., *Simulation of Production Process Reorganized with Value Stream Mapping*, Tehnički vjesnik – Technical Gazette, (ISSN 1330-3651), 18 (3), 2011., str. 341-347 3. Gjeldum, N., Veža, I., Bilić, B., *Prediction of Material Removal Rates of Cylindrical Wire Electrical Discharge Turning Processes*, Transactions of FAMENA, (ISSN 1333-1124), 35 (1), 2011., str. 27-38 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., Radojičić, M., Veža, I., Nešić, Z., *Some considerations on the development of the information subsystem for production planning*, Proceedings of the 1st International Symposium "Engineering Management and Competitiveness" (EMC2011), (ISBN 978-86-7672-135-1), str. 131-136, Zrenjanin, 2011.
Professional and scholarly articles published in the last five years in subjects of teaching methodology and teaching quality (5 works at most)	
Professional, science and artistic projects in the field of the course carried out in the last five years (5 at most)	Innovative Smart Enterprise (INSENT), HRZZ, 2014.-2018.
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)	Production planning: 4.2 Measurements in engineering: 3.7

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

Authorship of university/faculty textbooks in the field of the course	
Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)	(2012.) Mira Braović Plavša and Ivana BojčićLanguage Borrowings The periodical of Međimursko Veleučilište, Čakovec (2016) Mira BraovićPlavša and Ivana Bojčić What kind of Culture do we teach? The periodical Folia Linguistica et Litteraria (2016) Nikšić, Montenegro, 12
Professional and scholarly articles published in the last five years in subjects of teaching methodology and teaching quality (5 works at most)	(2014) Mira Braović Plavša/ Ivana Bojčić: The need analysis in general English language courses, Školski vjesnik, 63, Split
Professional, science and artistic projects in the field of the course carried out in the last five years (5 at most)	
The name of the programme and the volume in which the main teacher passed exams in/acquired the methodological-psychological-didactic-pedagogical group of competences?-pedagoške kompetencije?	University degree at the Faculty of Philology – pedagogical group
PRIZES AND AWARDS, STUDENT EVALUATION	
Prizes and awards for teaching and scholarly/artistic work	
Results of student evaluation taken in the last five years for the course that is comparable to the course described in the form (evaluation organizer, average grade, note on grading scale and course evaluated)	4.9/5

First and last name and title of teacher	**Vedrana Cvitanić, Ph. D., Associate Professor**
The course he/she teaches in the proposed study programme	Mechanics of Materials / Technical Mechanics 1
GENERAL INFORMATION ON COURSE TEACHER	
Address	Lovretska 19, 21000 Split, Hrvatska
Telephone number	021-305-970
E-mail address	vcvit@fesb.hr
Personal web page	
Year of birth	1970.
Scientist ID	233760
Research or art rank, and date of last rank appointment	Scientific Adviser, 11/5/2011
Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment	Associated Professor, 19/7/2012
Area and field of election into research or art rank	Technical Sciences, Field Basic Technical Sciences
INFORMATION ON CURRENT EMPLOYMENT	
Institution where employed	Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture
Date of employment	22/09/1995
Name of position (professor, researcher, associate teacher, etc.)	Associated Professor
Field of research	Theory of plasticity, Continuum mechanics
Function	
INFORMATION ON EDUCATION – Highest degree earned	
Degree	PhD
Institution	Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture
Place	Split
Date	19/05/2006
INFORMATION ON ADDITIONAL TRAINING	
Year	
Place	
Institution	
Field of training	
MOTHER TONGUE AND FOREIGN LANGUAGES	
Mother tongue	Croatian
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	English (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	Mechanics 1 - Mechanical Engineering, Naval Architecture, Undergraduate study programme, FESB

where it is/was offered, and level of study programme)	Mechanics 1 - Industrial Engineering, Undergraduate study programme, FESB Theory of Plasticity and Viscoelasticity - Mechanical Engineering, Graduate study programme, FESB
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. Cvitanić, V., Kovačić, M., Vladislavić, A., Numerical analysis of accuracy for evolutionary anisotropic plasticity models, *Engineering review* 36 (3), 255-267, 2016. 2. Cvitanić, V., Kovačić, M., Algorithmic formulation for evolutionary anisotropic plasticity model for sheet metals, Proceedings of the 8th International Congress of Croatian Society of Mechanics, CD-ROM, Opatija, Croatia, 2015. 3. Cvitanić, V., Ivandić, D., Lela, B., Comparison of orthotropic constitutive models in predicting square cup deep drawing process of AA2090-T3 sheet, Conference Proceedings of 4th International conference "Mechanical Technologies and Structural Materials", str. 61-70, Split, Croatia, 2014. 4. Cvitanić, V., Ivandić, D., Krstulović-Opara, L., Influence of constitutive and process parameters on the cylindrical cup deep drawing predictions for Al2090-T3 sheet. Conference Proceedings of 3rd International conference "Mechanical Technologies and Structural Materials", str. 117-126, Split, Croatia, 2013. 5. Cvitanić, V., Salečić, M., Vukasović, M., Numerical simulations of S-rail forming for Al 6111-T4 sheet based on Hill stress function, Proceedings of 7th International Congress of Croatian Society of Mechanics, CD-ROM, Zadar, Croatia, 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. FESB - reseach project, Linear and nonlinear analysis of thin-walled structures, 2013.- 2. Croatian Ministry of Science, Education and Sport - science project number 023-0231744-1747, Inverse procedures and advanced algorithms in dynamics of structures and machines, 2006.-2013. 3. Croatian Ministry of Science, Education and Sport - science project number 023-0231744-3113, Intelligent and evolutionary algorithms in the optimization of materials and structures, 2006.-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	ME4CataLOgue (Mechanical Engineering for Catalogue) Hrvatski katalog znanja, vještina i kompetencija za studije strojarstva temeljen na ishodima učenja. (participation at workshop „Training for teachers", April 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	Mechanics 1 - Undergraduate study programme, Mechanical Engineering, Naval Architecture - 4,2/5

that is comparable to the course described in the form (evaluation organizer, average grade, note on grading scale and course evaluated)	Mechanics 1 - Undergraduate study programme, Industrial Engineering - 4,3/5 Mechanics of Materials – Professional study programme, Mechanical Engineering, Naval Architecture – 4,3/5

First and last name and title of teacher	**Željko Domazet, Ph. D., Full Professor**
The course he/she teaches in the proposed study programme	Technical drawing and descriptive geometry 1
GENERAL INFORMATION ON COURSE TEACHER	
Address	R. Boškovića 32
Telephone number	+385/21/305777
E-mail address	Zeljko.domazet@fesb.hr
Personal web page	www.fesb.hr
Year of birth	1954
Scientist ID	95632
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 2005.
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	1980.
Name of position (professor, researcher, associate teacher, etc.)	Full professor - permanent position
Field of research	metal structures, fatigue
Function	head of Department of Mechanical Eng. And Naval Arch.
INFORMATION ON EDUCATION – Highest degree earned	
Degree	Dr.sc.
Institution	FSB-Zagreb
Place	Zagreb
Date	1993.
INFORMATION ON ADDITIONAL TRAINING	
Year	1988., 1990.
Place	Darmstadt, Germany
Institution	Fraunhofer Institut fuer Betriebsfestigkeit
Field of training	Fatigue
MOTHER TONGUE AND FOREIGN LANGUAGES	
Mother tongue	Croatian
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	English 5
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	German 3
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	
COMPETENCES FOR THE COURSE	
Earlier experience as course teacher of similar courses (name title of course, study programme where it is/was offered, and level of study programme)	

Authorship of university/faculty textbooks in the field of the course	L. Krstulović-O., Ž. Domazet: Dizajn industrijskih proizvoda V.Grubišić, Ž. Domazet: Pogonska čvrstoća-interna skripta 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)	1. Domazet, Željko; Lukša, Francisko; Stanivuk, Tatjana. **An optimal design approach for calibrated rolls with respect to fatigue life**. // *International journal of fatigue*. **59** (2014) ; 50-63 2. Krstulović-Opara, Lovre; Domazet, Željko; Garafulić, Endri. **Detection of osmotic damages in GRP boat hulls**. // *Infrared physics & technology*. **60** (2013.) ; 359-364 3. Domazet, Željko; Lukša, Francisko; Bugarin, Miro. **Fatigue Strength of the Rolls with Grooves**. // *Applied Mechanics and Materials*. **459** (2014) ; 330-334 4. Domazet, Željko; Lukša, Francisko; Stanivuk, Tatjana. **The influence of rolling speed on the fatigue life of rolls with grooves**. // *International journal of damage mechanics*. (2014) 5. Krstulović-Opara, Lovre; Garafulić, Endri; Klarin, Branko; Domazet, Željko. **Application of gradient based IR thermography to the GRP structures inspection**. // *Key Engineering Materials*. **488-489** (2012) ; 682-685
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. Domazet, Željko; Lukša, Francisko. **Influence of Rolling Temperature on Fatigue Life of Calibrated Rolls**. // *Advanced materials research*. **742** (2013) ; 482-487 2. Domazet, Željko; Lukša, Francisko; Šušnjar, Marko; Korun Curić, Kristina. **Stress-time History of Rolls with Grooves**. // *Transactions of FAMENA*. **35** (2011) , 3; 67-74 3. Krstulović-Opara, Lovre; Domazet, Željko; Klarin, Branko; Garafulić, Endri. **The Application of IR Thermography to the NDT and Thermal Stress Analysis**. // *HDKBR info*. **1** (2012.) , 6/7; 17-22 4. Krstulović-Opara, Lovre; Klarin, Branko; Neves, Pedro; Domazet, Željko. **Thermal imaging and Thermal Stress Analysis of the impact damage of composite materials**. // *Engineering failure analysis*. **18** (2011) ; 713-719 Vesenjak, Matej; Krstulović-Opara, Lovre; Ren, Zoran; Domazet, Željko. **Cell shape effect evaluation of polyamide cellular structures**. // *Polymer testing*. **29** (2010) , 8; 991-994
The name of the programme and the volume in which the main	„Training for administrative and educational personnel“ part of the EU project ME4CataLOgue (Mechanical Engineering for

teacher passed exams in/acquired the methodological-psychological-didactic-pedagogical group of competences?-pedagoške kompetencije?	Catalogue)
PRIZES AND AWARDS, STUDENT EVALUATION	
Prizes and awards for teaching and scholarly/artistic work	University of Split, Rector price, 2015.
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	**Sonja Jozić, Ph. D., Assistant Professor**
The course he/she teaches in the proposed study programme	Computer aided manufacturing
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 study programme)	**Undergraduate studies:** 3. Tehnology 1 (130) **Graduate studies:** 1. Computer aided manufacturing (261,262,263) 2. Nonconventional machining processes (261,262, 263)

	3. Machine tools (261, 263) 4. Machine tools and systems (270) **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	**Ivica Jurić-Grgić, Ph.D., Associate Professor**
The course he/she teaches in the proposed study programme	Electrical Engineering
GENERAL INFORMATION ON COURSE TEACHER	
Address	Pujanke 59, 21000 Split, Croatia
Telephone number	+385 21 305-811
E-mail address	ijuricgr@fesb.hr
Personal web page	-
Year of birth	1977.
Scientist ID	248792
Research or art rank, and date of last rank appointment	Senior scientific associate, 12/7/2012
Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment	Associate Professor, 20/9/2016
Area and field of election into research or art rank	Technical Sciences, Field Electrical engineering
INFORMATION ON CURRENT EMPLOYMENT	
Institution where employed	Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture
Date of employment	23/9/2001
Name of position (professor, researcher, associate teacher, etc.)	Associate Professor
Field of research	Power engineering
Function	-
INFORMATION ON EDUCATION – Highest degree earned	
Degree	PhD
Institution	Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture
Place	Split
Date	10/3/2008
INFORMATION ON ADDITIONAL TRAINING	
Year	-
Place	-
Institution	-
Field of training	-
MOTHER TONGUE AND FOREIGN LANGUAGES	
Mother tongue	Croatian
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	English (4)
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)	Electrical Machines 1, Graduate study programme. Electrical Machines and Transformers, Vocational study programme. Electrical safety, Undergraduate study programme.
Authorship of university/faculty textbooks in the field of the course	-
Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)	• Jurić-Grgić, I.; Lucić, R.; Dabro, M.: "A coupled nonuniform transmission line analysis using FEM", International Transactions on Electrical Energy Systems, Vol.23 (8), 2013, pp. 1365–1372. • Lucić, R.; Jurić-Grgić, I.; Balaž, Z.: " Grounding grid transient analysis using the improved

	transmission line model based on the finite element method", ETEP: European Transactions on Electrical Power, Vol.23 (2), 2013, pp. 282–289. • Dabro, M.; Jurić-Grgić, I.; Martinović, M.: "Improvement of Synchronous Generator Power Stability Using Hydraulic Digital Governor", International Journal on Engineering Applications (IREA), Vol. 1 (5), 2013, pp. 263-267. • Dabro, M.; Jurić-Grgić, I.; Lucić, R.: "Optimization of Hydraulic Digital Governor parameters using EMTP-RV", International Journal on Engineering Applications (IREA), Vol. 1 (2), 2013, pp. 90-93. • Dabro, M.; Jurić-Grgić, I.; Lucić, R.: "EMTP-RV Model of Hydraulic Digital Governor", International Review on Modelling and Simulations (IREMOS), Vol. 4 (6), 2011, pp. 1-5.
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)	• Study: Elaborat iznošenja potencijala i izračun napona dodira i koraka za EVP 110/25 kV Novska, Naručitelj: Projektni biro Split, 2010. • Project: 023 0231581-1610, "Numeričko modeliranje elektroenergetskog sustava tehnikom konačnih elemenata", br. 023 0231581-1610, Ministarstvo znanosti, obrazovanja i športa Republike Hrvatske, 2007.-2011. • Study: Izrada pravila i mjera sigurnosti za osiguranje mjesta rada na elektroenergetskim vodovima, Naručitelj: HEP OPS d.o.o., Prijenosno područje Split, 2013.
The name of the programme and the volume in which the main teacher passed exams in/acquired the methodological-psychological-didactic-pedagogical group of competences?-pedagoške kompetencije?	-
PRIZES AND AWARDS, STUDENT EVALUATION	
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	Fluid mechanics Wind farms and hybrid energy systems
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	Fluid mechanics, 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	**Lovre Krstulović-Opara, Ph. D., Full Professor**
The course he/she teaches in the proposed study programme	Metal structures design
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 textbooks in the field of the course	L. Krstulović-O., Ž. Domazet: Dizajn industrijskih proizvoda (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	Metal forming by deformation
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. Duplancic, Igor; Lela, Branimir; Musa, Ante; Zovko, Oliver. **Functional Data Analyses in Control of Extrusion Process**. *Proceedings of the Tenth International Aluminum Extrusion Technology Seminar*. Wauconda, Illinois, USA : ET Foundation, 2012. 655-663
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 the volume in which the main teacher passed exams in/acquired the methodological-psychological-	Training for teachers and administrative staff within EU project ME4CataLOgue

didactic-pedagogical group of competences?	
PRIZES AND AWARDS, STUDENT EVALUATION	
Prizes and awards for teaching and scholarly/artistic work	
Results of student evaluation taken in the last five years for the course that is comparable to the course described in the form (evaluation organizer, average grade, note on grading scale and course evaluated)	4.8/5

First and last name and title of teacher	**Željan Lozina, Ph. D. Full Professor**
The course he/she teaches in the proposed study programme	Engineering Mechanics 2
GENERAL INFORMATION ON COURSE TEACHER	
Address	Rendićeva 18
Telephone number	021-305-968
E-mail address	zeljan.lozina@fesb.hr
Personal web page	http://marjan.fesb.hr/~lozina/
Year of birth	1956.
Scientist ID	96925
Research or art rank, and date of last rank appointment	Scientific Adviser, 21.06.2000.
Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment	Senior Full Professor, 09.03.2005.
Area and field of election into research or art rank	Engineering Sciences, Field Engineering mechanics
INFORMATION ON CURRENT EMPLOYMENT	
Institution where employed	Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture
Date of employment	22.10.1982
Name of position (professor, researcher, associate teacher, etc.)	Professor
Field of research	Dynamics/Vibration, Numerical methods, FEM
Function	Head of Chair of Dynamics and Vibration
INFORMATION ON EDUCATION – Highest degree earned	
Degree	PhD
Institution	FSB – Univerity of Zagreb
Place	Zagreb
Date	05.04.1989.
INFORMATION ON ADDITIONAL TRAINING	
Year	
Place	Udine, Italy
Institution	CISM
Field of training	Engineering Mechanics
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)	French (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)	Mechanics of materials, Programming, Mechanisms, Vehicle (ship) systems,…
Authorship of university/faculty textbooks in the field of the course	Finte element method, Univerity of Split

	Kinematics, Univerity of Split Dynamics, Univerity of Split Programming, Univerity of Split
Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)	1. 1. Sedlar, Damir; Lozina, Željan; Vučina, Damir: An implementation of structural change detection procedure based on experimental and numerical model correlation. // Journal of sound and vibration. 331 (2012) , 13; 3068-3082 2. Vučina, Damir; Lozina, Željan; Pehnec, Igor.: Ad-Hoc Cluster and Workflow for Parallel Implementation of Initial-Stage Evolutionary Optimum Design. // Structural and multidisciplinary optimization. 45 (2012) , 2; 197-222 3. Vučina, Damir; Lozina, Željan; Pehnec, Igor.: Computational procedure for optimum shape design based on chained Bezier surfaces parameterization. // Engineering applications of artificial intelligence. 25 (2012) , 3; 648-667 4. Vučina, Damir; Lozina, Željan; Vlak, Frane.: NPV-based decision support in multi-objective design using evolutionary algorithms. // Engineering applications of artificial intelligence. 23 (2010) , 1; 48-60 5. Lozina, Željan; Sedlar, Damir; Vučina, Damir.: Model Update with Observer/Kalman Filter and Genetic Algorithm Approach. // Transactions of FAMENA. 36 (2012)
Professional and scholarly articles published in the last five years in subjects of teaching methodology and teaching quality (5 works at most)	1. Cvitanić, Vedrana; Duplančić, Igor; Lozina, Željan; Ivandić, Daniel.:Earing predictions for Al2008-T4 sheet. // Aluminium and its alloys. 3 (2011) ; 73-77 2. Sedlar, Damir; Lozina, Željan; Vučina, Damir. 3. Comparison of Genetic and Bees Algorithm in the Finite Element Model Update. // Transactions of FAMENA. 35 (2011) , 1; 1-12
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: Mjeriteljska infrastruktura za pametne mreže, 2015. - 2018. 2. LLP - ERASMUS: Strategic Alignment of Electrical and Information Engineering in European Higher Education Institutions, 2012. -2014. 3. TEMPUS: Creation of the third cycle studies-doctoral studies in metrology Trajanje projekta: 2010. – 2013.
The name of the programme and the volume in which the main teacher passed exams in/acquired the methodological-psychological-didactic-pedagogical group of competences?-pedagoške kompetencije?	Me4
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	**Gojko Magazinović, Ph. D., Full Professor**
The course he/she teaches in the proposed study programme	Computer Aided Design
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	Computer Aided Design 1, Undergraduate study programme, Computer Aided Design 2, Graduate study programme

where it is/was offered, and level of 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)	4,5/5

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

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

	- Agentski orijentirani inteligentni sustavi za nadzor i zaštitu okoliša (Agents Oriented Intelligent Systems for Environment Control and Protection), - Inteligentni agenti u modeliranju i vođenju kompleksnih sustava (Intelligent Agents used for Complex Systems Modelling and Control), - Vođenje složenih sustava inteligentnim metodama (Intelligent Methods for Complex Systems Control).
The name of the programme and the volume in which the main teacher passed exams in/acquired the methodological-psychological-didactic-pedagogical group of competences?-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	**Ivančica Mirošević, Lectorer**
The course he/she teaches in the proposed study programme	Mathematics, Applied mathematics
GENERAL INFORMATION ON COURSE TEACHER	
Address	FESB, R. Boškovića 32, B801
Telephone number	021 305891
E-mail address	Ivancica.Mirosevic@fesb.hr
Personal web page	
Year of birth	1973
Scientist ID	248845
Research or art rank, and date of last rank appointment	
Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment	Lecturer, since 2011
Area and field of election into research or art rank	Area od Natural Sciences, Field of Mathematics
INFORMATION ON CURRENT EMPLOYMENT	
Institution where employed	FESB, Split
Date of employment	2001
Name of position (professor, researcher, associate teacher, etc.)	Lecturer
Field of research	Mathematics
Function	
INFORMATION ON EDUCATION – Highest degree earned	
Degree	Mr. sc.
Institution	University of Zagreb, Faculty of Natural Sciences and Mathematics,
Place	Zagreb, Croatia
Date	2005
INFORMATION ON ADDITIONAL TRAINING	
Year	
Place	
Institution	
Field of training	
MOTHER TONGUE AND FOREIGN LANGUAGES	
Mother tongue	Croatian
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	English (4)
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	
COMPETENCES FOR THE COURSE	
Earlier experience as course teacher of similar courses (name title of course, study programme where it is/was offered, and level of study programme)	Lecturer of various courses since 2001
Authorship of university/faculty	

textbooks in the field of the course	
Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)	
Professional and scholarly articles published in the last five years in subjects of teaching methodology and teaching quality (5 works at most)	Mirošević, Ivančica. Algoritam k-sredina. // KoG : znanstveno-stručni časopis Hrvatskog društva za konstruktivnu geometriju i kompjutorsku grafiku. 20 (2017) , 20; 91-98 (članak, stručni). Mirošević, Ivančica; Koceić-Bilan, Nikola; Jurko, Josipa. Različiti nastavno-metodički pristupi čunjosječnicama. // Math.e : hrvatski matematički elektronski časopis. 27 (2015) ; 1-10 (članak, stručni).
Professional, science and artistic projects in the field of the course carried out in the last five years (5 at most)	
The name of the programme and the volume in which the main teacher passed exams in/acquired the methodological-psychological-didactic-pedagogical group of competences?-pedagoške kompetencije?	
PRIZES AND AWARDS, STUDENT EVALUATION	
Prizes and awards for teaching and scholarly/artistic work	
Results of student evaluation taken in the last five years for the course that is comparable to the course described in the form (evaluation organizer, average grade, note on grading scale and course evaluated)	

First and last name and title of teacher	**Nedjeljko Mišina, Ph. D., Full Professor**
The course he/she teaches in the proposed study programme	Materials, Welding and Similar Treatments
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	**Sandro Nižetić, Ph. D., Associate Professor**
The course he/she teaches in the proposed study programme	Heating and Air Conditioning
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	Heating and air Conditioning, 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?-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)	4,9/5.0

First and last name and title of teacher	**Goran Petrović, Ph.D., Associate Professor**
The course he/she teaches in the proposed study programme	Introduction to computer applications
GENERAL INFORMATION ON COURSE TEACHER	
Address	Split, Ruđera Boškovića 32
Telephone number	+385 21 305 731
E-mail address	petrovic@fesb.hr
Personal web page	
Year of birth	1971
Scientist ID	248882
Research or art rank, and date of last rank appointment	Research scientist 19.12. 2012.
Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment	Associate professor 19.12. 2012.
Area and field of election into research or art rank	Technical sciences, electrical engineering
INFORMATION ON CURRENT EMPLOYMENT	
Institution where employed	FESB
Date of employment	30. 03. 1998.
Name of position (professor, researcher, associate teacher, etc.)	professor
Field of research	Electrical and process measurement, Signal processing
Function	Head of Department for power engineering
INFORMATION ON EDUCATION – Highest degree earned	
Degree	PhD
Institution	FESB
Place	Split
Date	24. 03. 2006.
INFORMATION ON ADDITIONAL TRAINING	
Year	
Place	
Institution	
Field of training	
MOTHER TONGUE AND FOREIGN LANGUAGES	
Mother tongue	Croatian
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	English; very good (4)
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	
COMPETENCES FOR THE COURSE	
Earlier experience as course teacher of similar courses (name title of course, study programme where it is/was offered, and level of study programme)	1. Measurement and signal processing, Electrical engineering, graduate 2. Process measurement, Electrical engineering, graduate 3. Instrumentation in electrical engineering, Electrical engineering, undergraduate
Authorship of university/faculty	

textbooks in the field of the course	
Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)	1. Bosnić, Juraj Alojzije; Petrović, Goran; Malarić, Roman. Estimation of the wall thermal properties through comparison of experimental and simulated heat flux // 21ST IMEKO TC-4 measurement. Budapest, 2016. 2. Mostarac, Petar; Malarić, Roman; Petrović, Goran. Measurement of frequency spectrum with interpolated adaptive chirp-z transformation // XXI IMEKO world congres. Prag,: Czech Technical University in Prague, 2015. 2008-2011. 3. Petrović, Goran; Malarić, Roman; Ivana, Kardum. Matlab based flickermeter // 20th IMEKO TC4 International Symposium and 18th International Workshop on ADC Modelling and Testing. Benevento: University of Sannio, 2014. 31-34. 4. Lorincz, Josip; Matijević, Tončica; Petrović, Goran. On interdependence among transmit and consumed power of macro base station technologies. // Computer communications. 50 (2014) ; 10-28 5. Petrović, Goran; Kilić, Tomislav; Garma, Tonko. Measurement and Estimation of the Extremely Low Frequency Magnetic Field of the Overhead Power Lines. // Elektronika ir elektrotechnika. 19 (2013) , 7; 33-36.
Professional and scholarly articles published in the last five years in subjects of teaching methodology and teaching quality (5 works at most)	
Professional, science and artistic projects in the field of the course carried out in the last five years (5 at most)	1. Smart grid metrology infrastructure, HRZZ Research Projects 2015- 2. Extracting electric energy from human body for supplying autonomous biomedical devices and new PVDF transducer optimization, Bilateral Croatian Italian scientific project 2010-2013.
The name of the programme and the volume in which the main teacher passed exams in/acquired the methodological-psychological-didactic-pedagogical group of competences?-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	**Tonči Piršić, Ph. D., Associate Professor**
The course he/she teaches in the proposed study programme	Technical Drawing And Descriptive Geometry 2
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 Enginering graphics 2 Undergraduate 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.
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	**Srdjan Podrug, Ph.D., Associate professor**
The course he/she teaches in the proposed study programme	Machine Elements 2
GENERAL INFORMATION ON COURSE TEACHER	
Address	Kroz Smrdečac 13
Telephone number	+385-91-4305-992
E-mail address	spodrug@fesb.hr
Personal web page	www.fesb.hr/~spodrug
Year of birth	1971
Scientist ID	233771
Research or art rank, and date of last rank appointment	Senior scientific associate, 10/02/2010
Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment	Associate professor, 17/02/2010
Area and field of election into research or art rank	Technical sciences, Mechanical Engineering
INFORMATION ON CURRENT EMPLOYMENT	
Institution where employed	University of Split, Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture
Date of employment	5/02/1996
Name of position (professor, researcher, associate teacher, etc.)	Associate professor
Field of research	Machine Elements, Fatigue, Fracture Mechanics
Function	Chair of Machine Elements
INFORMATION ON EDUCATION – Highest degree earned	
Degree	Ph.D.
Institution	University of Split, Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture
Place	Split
Date	27/09/2004
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)	Italian 2
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	
COMPETENCES FOR THE COURSE	
Earlier experience as course teacher of similar courses (name title of course, study programme where it is/was offered, and level of study programme)	Course teacher of courses: • Machine elements 1 and Machine elements 2 / undergraduate university study Mechanical engineering; • Machine elements / undergraduate university study Naval architecture, undergraduate vocational study Naval architecture and undergraduate university study Industrial

	engineering • Introduction to fracture mechanics and Mechanical drives / graduate university study Mechanical engineering • Integrity of machines and structures, Fracture mechanics and Machine Elements: Selected chapters / postgraduate university study Mechanical engineering
Authorship of university/faculty textbooks in the field of the course	
Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)	1. Jelaska, Damir; Podrug, Srdjan; Perkušić, Milan., Kinematic Synthesis of a Novel Type of the Series of Transmissions with Independently Controllable Output Speed, Mechanism and Machine Theory, 103 (2016); 189-201 2. Jelaska Damir; Podrug Srdjan; Perkušić Milan., A novel hybrid transmission for variable speed wind turbines, Renewable energy, 83 (2015); 78-84 3. Jelaska Damir; Podrug Srdjan; Perkušić, Milan., Proposition of the series of transmissions having an independently controllable output speed, International Journal Advanced Engineering, 6 (2015), 1; 13-21 4. Jelaska, Damir; Podrug, Srdjan; Perkušić, MIlan. On the feasibility of the power split type transmissions having independently controllable output speed, International Journal of Advanced Engineering, 7 (2013) 5. Perkušić, Milan; Jelaska, Damir; Podrug, Srdjan, Estimation of fatigue life of involute gears, Strojarstvo, 54 (2012), 5; 381-391 (in croatian)
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)	Development of components life assessment procedures (Project MSES no. 023-0692195-1749), 2007.-2013.
The name of the programme and the volume in which the main teacher passed exams in/acquired the methodological-psychological-didactic-pedagogical group of competences?-pedagoške kompetencije?	Training for teachers and administrative staff in 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)	Grade for the course Machine elements 2 at the undergraduate university study Mechanical engineering in the last year: 4,9/5.

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 and Hydraulic Machines, Marine Machinery and Devices
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	– Implementacije ishoda učenja u razvoj studijskih programa i kurikuluma; Povezivanje ishoda učenja i metoda

teacher passed exams in/acquired the methodological-psychological-didactic-pedagogical group of competences	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	**Damir Sedlar, Ph. D., Assistant Professor**
The course he/she teaches in the proposed study programme	Engineering mechanics 2 Noise and Vibration Control
GENERAL INFORMATION ON COURSE TEACHER	
Address	Ruđera Boškovića 32, 21000 Split
Telephone number	021/305-967
E-mail address	dsedlar@fesb.hr
Personal web page	http://marjan.fesb.hr/~dsedlar/
Year of birth	1976.
Scientist ID	248913
Research or art rank, and date of last rank appointment	Research scientist, March, 2013.
Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment	Assistant professor, September, 2012.
Area and field of election into research or art rank	Technical Sciences, field fundamentals technical sciences
INFORMATION ON CURRENT EMPLOYMENT	
Institution where employed	Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture
Date of employment	2001
Name of position (professor, researcher, associate teacher, etc.)	Assistant professor
Field of research	Dynamics, finite element method, noise and vibration, optimization
Function	
INFORMATION ON EDUCATION – Highest degree earned	
Degree	PhD
Institution	Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture
Place	Split
Date	2009
INFORMATION ON ADDITIONAL TRAINING	
Year	
Place	
Institution	
Field of training	
MOTHER TONGUE AND FOREIGN LANGUAGES	
Mother tongue	Croatian
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	English (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 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)	
Professional and scholarly articles published in the last five years in subjects of teaching methodology and teaching quality (5 works at most)	- Sedlar, Damir; Lozina, Željan; Vučina, Damir. An implementation of structural change detection procedure based on experimental and numerical model correlation. // Journal of sound and vibration. 331 (2012) - Lozina, Željan; Sedlar, Damir; Vučina, Damir. Model Update with Observer/Kalman Filter and Genetic Algorithm Approach. // Transactions of FAMENA. 36 (2012)
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
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	**Marija Šiško Kuliš, Ph.D., Associate Professor**
The course he/she teaches in the proposed study programme	Assessment of technology projects Introduction to Entrepreneurship
GENERAL INFORMATION ON COURSE TEACHER	
Address	Ilijin potok 16, 21210 Solin
Telephone number	098 414 732
E-mail address	marija.sisko-kulis@hep.hr
Personal web page	
Year of birth	1966.
Scientist ID	217703
Research or art rank, and date of last rank appointment	
Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment	Associate Professor, May2011.
Area and field of election into research or art rank	Technical sciences, mechanical engineering
INFORMATION ON CURRENT EMPLOYMENT	
Institution where employed	HEP Proizvodnja d.o.o., vanjski suradnik na Fakultetu strojarstva i brodogradnje u Splitu.
Date of employment	1.rujna 1994.
Name of position (professor, researcher, associate teacher, etc.)	Head of mechanical department at Hydro South
Field of research	Mechanical engineering, investment projects
Function	The manager and supervising engineer
INFORMATION ON EDUCATION – Highest degree earned	
Degree	PHD
Institution	Faculty of Mechanical Engineering and Naval Architecture, Zagreb
Place	Zagreb.
Date	21.09.2000.
INFORMATION ON ADDITIONAL TRAINING	
Year	1998/1999; 1995-1997
Place	LJubljana
Institution	Turboinštitut
Field of training	Water turbine_management of project reconstruction of hydroelectric power plants
MOTHER TONGUE AND FOREIGN LANGUAGES	
Mother tongue	Hrvatski
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	Engleski – 4
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	Njemački - 3
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	
COMPETENCES FOR THE COURSE	
Earlier experience as course teacher of similar courses (name title of course, study programme where it is/was offered, and level of	• 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	Economics and Production Organisation
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	Dulčić, Želimir; Pavić, Ivan; Rovan, Mario; Veža, Ivica: Proizvodni management, Ekonomski fakultet, FESB Split, Split, 1996.
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)	4. 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. 5. Čelar, Stipe; Turić, Mili; Dragičević, Srdjana; Veža, Ivica. Digital Learning Factory at FESB – University of Split , ZBORNIK RADOVA YU INFO 2016, 2016. 001-006 6. 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 7. 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)	4. 2008 – 2013 Project TEMPUS-2008-IT-JPCR 144 959, Master Study Program in Product Lifecycle Management with Sustainable Production 5. 2011-2014 LEONARDO DA VINCI Project “LOPEC - Logistics personnel excellence by continuous self-assessment”, FESB Split, University of Reutlingen 6. 2013-2016 Network of Innovative Learning Factories NIL, “System - Learning Factory“, FESB, Split, University of

	Reutlingen 7. 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 8. 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	**Frane Vlak, Ph. D., Full Professor**
The course he/she teaches in the proposed study programme	Technical Mechanics 1 …….
GENERAL INFORMATION ON COURSE TEACHER	
Address	Ruđera Boškovića 32
Telephone number	021305971
E-mail address	fvlak@fesb.hr
Personal web page	
Year of birth	1968.
Scientist ID	233385
Research or art rank, and date of last rank appointment	Scientific Adviser, 11/11/2015
Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment	Associate Professor, 29/9/2011
Area and field of election into research or art rank	Technical Sciences, Field Electrical engineering
INFORMATION ON CURRENT EMPLOYMENT	
Institution where employed	Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture
Date of employment	6/6/1995
Name of position (professor, researcher, associate teacher, etc.)	Professor
Field of research	Mechanics of deformable solids
Function	Head of Chair of Mechanics
INFORMATION ON EDUCATION – Highest degree earned	
Degree	PhD
Institution	Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture
Place	Split
Date	13/1/2006
INFORMATION ON ADDITIONAL TRAINING	
Year	
Place	
Institution	
Field of training	
MOTHER TONGUE AND FOREIGN LANGUAGES	
Mother tongue	Croatian
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	English (4)
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	Italian (2)
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	
COMPETENCES FOR THE COURSE	
Earlier experience as course teacher of similar courses (name title of course, study programme where it is/was offered, and level of study programme)	Technical mechanics 1, Mechanics of materials: Professional studies of mechanical engineering and naval architecture, Undergraduate study programme Mechanics of materials: University studies of mechanical engineering, naval architecture and industrial engineering, Undergraduate study programme

Authorship of university/faculty textbooks in the field of the course	
Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)	1. Barle, Jani; Grubišić, Vatroslav; Vlak, Frane. Failure analysis of the highway sign structure and the design improvement. // Engineering failure analysis. 18 (2011) , 3; 1076-1084 (članak, znanstveni). 2. Vlak, Frane; Cvitanić, Vedrana; Vučina, Damir. An approach for reduction of the volume loss in the rigid-plastic FEM using two-step updating procedure. // International journal of mechanical sciences. 53 (2011) , 10; 839-845 (članak, znanstveni). 3. Pavazza, Radoslav; Vlak, Frane; Vukasović, Marko. Bending and torsion of stiffeners with L sections under the plate normal pressure // Advanced Ship Design for Pollution Prevention / Soares, Guedes C. ; Parunov, Joško (ur.). London : CRC Press/Balkema, Taylor & Francis Group, 2010. Str. 121-127. 4. Vlak, Frane; Pavazza, Radoslav; Vukasović, Marko. An approximate analytic solution for the stresses and displacements of thin-walled orthotropic beams subjected to bending // 16th European Conference on Composite Materials ECCM16-Conference Proceedings-Seville, Spain: University of Seville, Spain, 2014. / Paris, Federico (ur.). Seville : University of Seville, 2014. 1-8 (predavanje,međunarodna recenzija,objavljeni rad,znanstveni). 5. Pavazza, Radoslav; Matoković, Ado; Vlak, Frane. An analytical solution for displacements and stresses for mono symmetrical stiffend plate structures under transverse loads // Knjiga sažetaka XX. simpozija Teorija i praksa brodogradnje in memoriam prof. Leopolod Sorta / Žiha, Kalman (ur.). Zagreb : Fakultet strojarstva i brodogradnje, Brodarski institut d.o.o., 2012. 76-76 (predavanje,međunarodna recenzija,objavljeni rad,znanstveni).
Professional and scholarly articles published in the last five years in subjects of teaching methodology and teaching quality (5 works at most)	
Professional, science and artistic projects in the field of the course carried out in the last five years (5 at most)	9.
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?	ME4CataLOgoue (Mechanical Engineering for Catalogue) Croatian Catalogue of knowledge, skills and competences for Mechanical Engineering studies (Bachelor, Master and Doctoral study programmes) based on learning outcomes
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	**Dražen Živković, Ph.D. Full Professor**
The course he/she teaches in the proposed study programme	Materials, , Basic of Tribology
GENERAL INFORMATION ON COURSE TEACHER	
Address	Rovinjska 4, 21000 Split, Republic of Croatia
Telephone number	+385 21 305910
E-mail address	Drazen.Zivkovic@fesb.hr
Personal web page	/
Year of birth	1957.
Scientist ID	044701
Research or art rank, and date of last rank appointment	Scientific Adviser, 21/01/2009.
Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment	Senior Full Professor, 05/06/2014
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	13/09/1983.
Name of position (professor, researcher, associate teacher, etc.)	Professor
Field of research	
Function	Head of Mechanical Engineering Technology Department
INFORMATION ON EDUCATION – Highest degree earned	
Degree	PhD
Institution	Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture
Place	Split
Date	04/09/1999.
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 (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)	Materials, , Basic of Tribology (530) Materials 1, Materials 2, Technology 1, Tribology, (130, 140, 150) Heat treatment and surface protection (263)

Authorship of university/faculty textbooks in the field of the course	Dražen, Živković: Lijevanje, ISBN 978-953-6114-91-7
Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)	1. Živković, Dražen; Gabrić, Igor; Šitić, Slaven. Popravak zavarivanjem konstrukcija iz titanovih legura. // Strojarstvo. 53 (2011) , 4; 319-326 2. Živković, Dražen; Gabrić, Igor; Šitić, Slaven. Utjecaj niskog i visokog popuštanja na tvrdoću čelika EN 42CRM04. // Tehnički glasnik. 6 (2012) 3. Živković, Dražen; Gabrić, Igor; Šitić, Slaven. Analiza utjecaja parametara toplinske obrade na tvrdoću čelika EN 42CrMo4 // MATRIB 2012 materials/tribology/recycling : zbornik radova = conference proceedings / Željko Alar, Suzana Jakovljević (ur.). Zagreb : Hrvatsko društvo za materijale i tribologiju, 2012. 379-386 4. Živković, Dražen; Gabrić, Igor; Šitić, Slaven. Utjecaj toplinske obrade na dinamičku izdržljivost čelika EN 42CrMo4 // International conference Heat Treatment and Surface Engineering - European Opportunities for Croatian Economy : proceedings book = Međunarodno savjetovanje Toplinska obrada i inženjerstvo površina - europske mogućnosti hrvatskog gospodarstva : zbornik radova / Smojan, Božo ; Iljkić, Dario (ur.). Rijeka : Hrvatsko društvo za toplinsku obradu i inženjerstvo površina, 2012. 67-74 5. Ljumović, Petar; Živković, Dražen; Dadić, Zvonimir; Gabrić, Igor. IZBOR MATERIJALA KALUPA ZA VISOKOTLAČNO LIJEVANJE // MATRIB 2014, materials, tribology, recycling / Šolić, Sanja ; Šnajder Musa, Matea (ur.). Zagreb : Hrvatsko društvo za materijale i tribologiju, 2014. 307-317
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)	Projekt: „Računalno optimiranje parametara termalnih procesa obrade metala“, voditelj prof.dr.sc. Božo Smoljan
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	One form per each teacher/co-teacher
The course he/she teaches in the proposed study programme	
GENERAL INFORMATION ON COURSE TEACHER	
Address	
Telephone number	
E-mail address	
Personal web page	
Year of birth	
Scientist ID	
Research or art rank, and date of last rank appointment	
Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment	
Area and field of election into research or art rank	
INFORMATION ON CURRENT EMPLOYMENT	
Institution where employed	
Date of employment	
Name of position (professor, researcher, associate teacher, etc.)	
Field of research	
Function	
INFORMATION ON EDUCATION – Highest degree earned	
Degree	
Institution	
Place	
Date	
INFORMATION ON ADDITIONAL TRAINING	
Year	
Place	
Institution	
Field of training	
MOTHER TONGUE AND FOREIGN LANGUAGES	
Mother tongue	
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	
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)	
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)	

3.4. Optimal number of students

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

3.5. Estimate of costs per student

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

3.6. Plan of procedures of study programme quality assurance

<table>
<tr><td colspan="2">In keeping with the European standards and guidelines for internal quality assurance in higher education institutions (according to “Standards and Guidelines of Quality Assurance in the European Higher Education Area”) on the basis of which the University of Split defines procedures for quality assurance, the proposer of the study programme is obliged to draw up a plan of procedures of study programme quality assurance.</td></tr>
<tr><td colspan="2">Documentation on which the quality assurance system of the constituent part of the University is based:</td></tr>
<tr><td colspan="2">• Regulations on the quality enhancement system of FESB</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 is monitoring the harmonisation of grading and learning outcomes.
All the procedures are conducted in accordance with the Rules of procedure of the Faculty Council and the Rules of procedure of the Department, since the Committees for study programmes are bodies of the Faculty Council and</td></tr>
</table>

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