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

FACULTY OF ELECTRICAL ENGINEERING, MECHANICAL ENGINEERING AND NAVAL ARCHITECTURE

DETAILED PROPOSAL OF THE STUDY PROGRAMME

UNDERGRADUATE VOCATIONAL STUDY IN NAVAL ARCHITECTURE

SPLIT, June 2017

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GENERAL INFORMATION OF HIGHER EDUCATION INSTITUTION

Name of higher education institution	FACULTY OF ELECTRICAL ENGINEERING, MECHANICAL ENGINEERING AND NAVAL ARCHITECTURE
Address	Ulica Ruđera Boškovića 32
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GENERAL INFORMATION OF THE STUDY PROGRAMME

Name of the study programme	VOCATIONAL UNDERGRADUATE STUDY IN NAVAL ARCHITECTURE		
Provider of the study programme	FACULTY OF ELECTRICAL ENGINEERING, MECHANICAL ENGINEERING AND NAVAL ARCHITECTURE		
Other participants			
Type of study programme	Vocational study programme ☒	University study programme ☐	
Level of study programme	Undergraduate ☒	Graduate ☐	Integrated ☐
	Postgraduate ☐	Postgraduate specialist ☐	Graduate specialist ☐
Academic/vocational title earned at completion of study	Vocational Bachelor of Naval Architecture, bacc. ing. nav. arch.		

1. INTRODUCTION

1.1. Reasons for starting the study programme

Naval architecture is a scientific and technical field that covers the study and use of natural, engineering and partly of the social sciences, required to design and produce a ship – a product of high capital value. Similar to other engineering professions, naval architecture connects mathematics, physics and other natural sciences. However, in order to produce complex and complicated products, it also requires the specific knowledge related to various production activities. Modern Naval architecture is broad and interdisciplinary field and there is virtually no human activity that is not applied in its product or that has not significantly contributed to its development. One of the features of naval architecture is its extremely rapid development, since more than two-thirds of the global transport of passengers and goods is still carried by ship. Electronics, automation, computing and robotics particularly contributed to the above mentioned development as they enabled a great increase in the quality of the automatic control, both in the processing industry, as well as in the operation of the ship. Continuous and rapid development, as well as new findings and achievements, necessarily require corresponding educational processes. Well-educated and competent professionals are an essential prerequisite for rapid development and for keeping pace with the developed countries. Goal of the proposed study in Naval Architecture is education of the staff in the fields of design, construction, equipment, management, building, repair and maintenance of the ship, but also to meet the demands of the economy, higher education institutions, governmental and other public institutions.

Undergraduate vocational study in Naval Architecture was developed in order to enable students to acquire basic theoretical knowledge and practical expertise, and to prepare them for permanent adoption of new knowledge and technologies. In addition, during the course of studies each student develops skills of creative thinking, independent and team work and ability to make business decisions at all levels of decision-making. The teaching process conforms with global and particularly with European trends in higher education and with the needs of the economy, and accordingly, appropriate curricula are created. Undergraduate vocational study in Naval Architecture is closely related to current scientific achievements in the scientific area of engineering sciences, in the field of the design, technology of vessel construction, computing, information technology and natural sciences. FESB researchers, including those from the Department of Naval Architecture, are actively involved in the development of these scientific and professional fields. Furthermore, cooperation with renowned domestic and foreign research institutions was established, representing one of the major commitments of the Faculty.

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

Split is the powerful economic and university centre of the major part of the Dalmatian region. The Faculty of Electrical Engineering in Split was established in 1960, with the aim of educating skilled professionals for the sectors of economy based on electrical engineering and later on mechanical engineering and naval architecture as well. Purpose of the study in Naval Architecture is reflected in the need for educated experts, considering that eight large and medium-sized shipyards, the Croatian Register of Shipping and a wide variety of companies engaged in shipbuilding industry exist in the area. Demands of the labour market for this profile of experts are very large which is especially important at the present time when social and economic changes require the development of new, small or medium-sized, technologically advanced shipyards and corresponding industries. It is impossible to imagine modern shipbuilding industry in the area of computer-aided ship design and construction and organization and management at the second and third production level, without qualified experts able to solve production issues first on theoretical basis, and then practically. In addition, over the past 15 years so called small shipbuilding in Croatia significantly developed and, according to official statistics, the number of employees in this sector increased from approximately 1000 in the year 2000, to more than 12.000 employees in 2010. Furthermore, according to data collected from the Croatian Bureau of Statistics and the Croatian Employment Service, the number of unemployed engineers of Naval Architecture is in constant decline year after year, despite the economic crisis. According to FESB data, most students who completed the undergraduate vocational study programme in Naval Architecture find employment immediately after graduation. Due to the current situation in the labour market, capacity of the study programme in Naval Architecture is full for several years in a row.

1.3. Compatibility with requirements of professional organizations

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 scientific and educational activities with a number of private enterprises and public organisations such as: Brodosplit, Brodotrogir, AD boats, Adriawinch, Ericsson Nikola Tesla, national power company HEP, Split-Dalmatia County, Ministry of Defence, Energy institute “Hrvoje Požar”, Croatian telecom, Croatian academic and research network – CARNet, Technology Centre Split, Siemens, VIPnet, Microsoft Croatia etc. Also, it is important to note that the Croatian Armed Forces expressed a special interest in cooperation, since prospective officers are trained at the Faculty.

1.5. Financing

Funded by Ministry of Science and Education.

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

Undergraduate vocational study in Naval Architecture is organized according to the Bologna principles and is evaluated by the ECTS credit system. FESB students can currently enrol only vocational study programme. However, the organisation of studies and the ECTS credit system enable them to continue their education at other vocational study programmes in naval architecture at other universities in Croatia or the EU. Based on the analysis of study in naval architecture at Croatian and European universities, and in accordance with the needs of modern shipbuilding industry and needs of our shipyards, a proposal regarding organization of the undergraduate vocational study in Naval Architecture was prepared. The proposed study programme offers during the first two years of studies basic science courses, basic engineering courses and several non-engineering courses as well as several introductory specialised courses in the field of naval architecture. The majority of the courses at the third year are specialised courses in naval architecture and students can choose two courses and final thesis.

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

Mobility and international cooperation is defined by the Quality Assurance Handbook. Faculty has clearly defined criteria and conditions regarding transfer of students from related study programmes. The procedure of recognition of related courses for transfer of students from related study programmes is regulated. Faculty implements procedures according to the Regulations on international mobility of students, teaching and non-teaching staff within the framework of the Erasmus exchange program that regulates the basic principles of mobility. Faculty ensures conditions for the mobility of students in the European Higher Education Area (ERASMUS, ERASMUS MUNDUS, CEEPUS and similar). As far as vertical mobility is concerned, graduate study in Naval Architecture is primarily followed by the postgraduate study programmes in Naval Architecture at the Faculty of Mechanical Engineering and Naval Architecture (University of Zagreb) and the Faculty of Engineering (University of Rijeka) or at specific universities in the EU, e.g. Royal Institute of Technology (KTH) in Stockholm, Master Nordic Studies (related study programmes in Naval Architecture in 5 EU countries) and others. In accordance with their personal preferences and field of study, students can enrol related postgraduate study programmes, primarily study programme in Mechanical Engineering at FESB or at some other faculty in Croatia. As far as horizontal mobility is concerned, graduate study in

Naval Architecture is open to student mobility between related study programmes at all higher education institutions in Croatia. Students will be allowed to complete one part of the study programme at one of the related institutions in Croatia or abroad, which is facilitated by the introduction of the Bologna system of education and ECTS system, as well as through the ERASMUS program or similar programs for student mobility. Due to the compatibility of the proposed programme with ECTS credit system, Croatian Qualification Framework as well as the recommendations of the Bologna system and foreign accreditation agencies (ASIIN), there is a clear recognition of qualifications that students achieve during the graduate study in Naval Architecture, resulting in clear opportunities for mobility between national and international universities, either during their studies or after completion and progress to postgraduate studies. Based on the ranking list, Faculty co-finances the most successful students who fulfil a part of their course requirements at a foreign institution within the framework of the Erasmus exchange program.

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

The Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture Development Strategy for the period 2012-2016 was adopted at the Faculty Council meeting of 2nd November 2011. The Faculty Strategy is conformed with the Development Strategy of the University which is the fundamental document of the University. FESB Development Strategy is available through the following link https://www.fesb.hr/o-fakultetu/dokumenti. Faculty mission and vision are singled out from the Strategy. FESB Development Strategy represents the basic document of the Faculty in which individual tasks crucial for the further development are clearly described and responsible persons, deadlines and indicators for each task are specified.

FESB adjusts its activities to modern trends by continuous and systematic improvements in the following areas: establishment, organization and implementation of study programmes. FESB provides quality services in higher education and scientific research activities and encourages active participation in the European higher education and research area. FESB directs its development towards the establishment of an educational and scientific research centre of excellence in the area of engineering sciences, in the fields of Electrical Engineering, Computing, Mechanical Engineering, Naval Architecture and Industrial Engineering. The Strategy of the Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture has been defined on the basis of the Development Strategy of the University, taking into account the specific features of the Faculty. The Strategy of the Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture, as well as the development strategy of the University are in line with the Network of Higher Education Institutions and Study Programmes in the Republic of Croatia. The proposed study programme is in line with the Strategy of the

Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture and modelled upon similar study programmes in the EU, taking into account our specific features. Due to presented contents and teaching methods it represents a new, modern and high-quality study.
Undergraduate vocational study in Naval Architecture conforms to the Strategy of the University of Split 2015-2020 (Mission, vision and strategic guidelines). In addition to mission and vision of the University of Split, in the process of defining strategic goals, the following strategic documents were taken into account as guidelines:

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

The proposed study programme conforms to the strategic document Network of Higher Education Institutions and Study Programmes in the Republic of Croatia, which encourages launching new study programmes in STEM area, which includes the proposed study programme.

1.9. Current experiences in equivalent or similar study programmes

FESB has extensive experience in delivering courses at similar programmes. Faculty of Electrical Engineering in Split was established in 1960, implementing a 2nd level study programme in Electrical Engineering, with programme duration of 8 semesters. 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 Faculty has implemented professional studies (level VI in former qualifications system) since 1979 until today, with hiatus during the period 1998-2001. At the vocational study programme, more than 70 students were awarded the degree of Engineer of Naval Architecture. Since 2001 Faculty implements a vocational study programme in Naval Architecture with programme duration of 5 semesters (150 ECTS credits). Since 2013 the study programme was extended to 6 semesters (180 ECTS credits). Upon its completion, students are awarded the degree of Vocational Bachelor of Naval Architecture. Due to the continuous effort invested in the development of curricula, a series of study programmes at the undergraduate, graduate and postgraduate studies were organized. Current curriculum of university undergraduate study in Naval Architecture was adopted in 2000 and includes 6 semesters. Upon its completion, students are awarded the degree of University Bachelor of Naval Architecture. After having completed this study programme, students can continue their education at graduate study in Naval Architecture at Faculty of Engineering, University in Rijeka. Furthermore, students can, after taking supplemental exams, enrol graduate study at

FSB in Zagreb. At the undergraduate study in Naval Architecture more than 100 students were awarded the degree of Bachelor of Naval Architecture. Until present day, more than 100 students completed vocational study in Naval Architecture and many of them, after taking supplemental exams, continued their education at related graduated study in Mechanical Engineering. Quality of education at FESB is confirmed by success and excellence of FESB graduates worldwide, including the highly developed countries. However, the most important is the fact that professionals trained at FESB represent a foundation of highly educated engineering human resources in the region. The Faculty organizes postgraduate study programmes in Electrical Engineering and Mechanical Engineering, which offer some courses related to the science of naval architecture. FESB meets all the requirements necessary for the realization of undergraduate vocational study in Naval Architecture: employed required number of teaching and non-teaching staff with the appropriate scientific and professional qualifications and appropriate premises and equipment necessary for the organisation of the high quality study programme.

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 Naval Architecture. The learning outcomes are aligned with the Croatian Qualification Framework Act.

KNOWLEDGE AND UNDERSTANDING

1. Demonstrate appropriate theoretical knowledge, methods and techniques important for shipbuilding, ships exploitation, marine facilities and drives,
2. Identify and apply professional principles relevant to the construction technology, organization and ship construction management,
3. Understand the key aspects and shipbuilding concepts,
4. Identify social, ethical, business and legal context of engineering,
5. Use acquired expertise to monitor and implement projects according to the established requirements and specifications,
6. Understand the methodology for projects design in the field of shipbuilding,
7. Use appropriate mathematical methods and tools.

SKILLS

8. Ability to apply the acquired professional knowledge to solve practical problems,

9. Ability to apply the acquired professional knowledge important for business development and ship exploitation,
10. Ability to calculate and design simple ship structures,
11. Ability to choose and apply adequate engineering methods and computer tools during control, maintenance and exploitation of the ship,
12. Ability to program a computer to solve the problem,
13. Ability to consolidate knowledge and practical skills during problem solving in the field of shipbuilding,

INDEPENDENCE

14. Ability to work efficiently, independently and as a part of the team; to present the results of work by giving a public oral presentation and preparing a written report,
15. Ability to effectively communicate, using various methods of communication, with the engineering community and society as a whole.

RESPONSIBILITY

16. Ability to assume personal and team responsibility for decisions and successful implementation and execution of tasks, taking into account scientific, social, economic, environmental and ethical aspects of the problem,
17. Demonstrate professional and ethical responsibility,
18. Identify the need and willingness to engage in lifelong learning.

2.3. Employment possibilities

According to data collected from Croatian Employment Service the number of unemployed engineers of Naval Architecture, in the period 2000-2015 is in constant decline. According to FESB data most students attending undergraduate vocational study programme in Naval Architecture find a job immediately after graduation, and are often employed by various companies already during their study. The main objective of the proposed study programme is the education of qualified Vocational Bachelors of Naval Architecture in order to meet the needs of shipbuilding and related industries as well as to meet the needs of the research organizations. Endorsement documents and signatures given by a number of regional companies are attached to the Proposal of the study programme in Naval Architecture.

Demand for professionals with these competencies significantly exceed the number of educated professionals in the region, Croatia and worldwide.

2.4. Possibilities of continuing studies at a higher level

After completing vocational undergraduate study in Naval Architecture students can take supplementary courses and then continue their education at graduate study in Mechanical Engineering at FESB, graduate study in Naval Architecture at Faculty of Mechanical Engineering and Naval Architecture in Zagreb or at the Faculty of Engineering in Rijeka.

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

Students from other study programmes in Naval Architecture in the Republic of Croatia, in Rijeka and Zagreb are eligible for admission to the undergraduate vocational study in Naval Architecture at FESB in Split.

2.6. Structure of the study

Study programme lasts 6 semesters, two semesters per academic year. Each semester is worth 30 ECTS credits.

2.7. Guiding and tutoring through the study system

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

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

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

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

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

2.10. Criteria and conditions for transferring the ECTS credits

Transfer or recognition of ECTS credits between 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 thesis is acquired 120 ECTS credits.	
Procedure of evaluation of final/diploma exam and evaluation and defence of final/diploma thesis	The final thesis is evaluated by the mentor (supervisor) and the defence of the final paper is conducted orally, in the presence of the mentor and students who also defend their thesis with the same mentor.	

2.12. List of mandatory and elective courses

List of courses								
Year of study: 1.								
Semester: I.								
STATUS	CODE	COURSE	HOURS IN SEMESTER					ECTS
			L	S	AE	LE	DE	
Mandatory	FEMY03	Mathematics	45	0	45	0	0	7
	FESR02	Engineering Mechanics 1	45	0	30	0	0	6
	FETR01	Materials	45	0	0	30	0	6
	FESY01	Introduction To Computer Applications	30	0	0	30	0	5
	FESS01	Computer and Engineering Graphics	30	0	0	0	15	4
	FEOS02	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
	FESS20	Ship Hull Forms	30	0	0	0	30	5
	FETR02	Welding and Similar Treatments	45	0	0	15	0	5
	FEOS04	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	FETS01	Manufacturing Processes	45	0	0	30	0	6
	FESR20	Thermodynamics	45	0	15	15	0	6
	FESR21	Fluid Mechanics	30	0	15	15	0	5
	FESS22	Hydrostatics and Stability	30	0	0	0	30	5
	FESS21	Ship Construction	30	0	0	0	30	5
	FESY03	Introduction to Entrepreneurship	30	0	15	0	0	3
	Total		210	0	45	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: 2.								
Semester: IV.								
STATUS	CODE	COURSE	HOURS IN SEMESTER					ECTS
			L	S	AE	LE	DE	
Mandatory	FESS23	Strength of Ships	45	0	30	0	15	8
	FESS25	Machine Elements	45	0	0	0	30	7
	FESS24	Floating Objects Building Technology	45	0	30	15	0	7
	FESS26	Shipbuilding Materials	30	0	0	15	0	4
	FETS03	Production Preparing and Planning	30	0	15	0	0	4
	Total		195	0	75	30	45	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	FESS36	Project	0	15	0	0	30	7
	FESS28	Ship Hydrodynamics	45	0	0	0	30	6
	FESS15	Computer Graphics in Naval Architecture	30	0	0	0	30	5
	FESS29	Marine Propulsion System	30	0	30	0	0	5
	FESS13	Floating Objects Maintenance and Repair	30	0	0	30	0	5
	FESS30	Floating Object Outfitting	30	0	0	0	0	2
	Total		165	15	30	30	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: 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	FESS10	Marine Machinery and Devices	30	0	30	0	0	5
	FESS17	Croatian Shipbuilding Heritage	30	0	0	30	0	5
	FESS31	Composite Ships	30	0	30	0	0	5
	FESS33	Advanced Marine Vehicles	30	0	0	30	0	5
	FESS32	Shipbuilding Process Organization	30	0	30	0	0	5
	FESS34	Special Materials and Building Technologies	30	0	30	0	0	5
	FESS36	Rules and Survey of Ship Building	30	0	30	0	0	5
	FESR16	Noise and Vibration Control	30	0	15	15	0	5
	Twoelective courses are chosen.							

2.13. Course description

NAME OF THE COURSE	ADVANCED MARINE VEHICLES							
Code	FESS33	Year of study	3					
Course teacher	Branko Blagojević	Credits (ECTS)	5					
Associate teachers	Josip Bašić	Type of instruction (number of hours)	L	S	AE	LE	DE	
			30	0	0	0	30	
Status of the course	Elective	Percentage of application of e-learning	0					

COURSE DESCRIPTION

Course objectives	Training students for: - Insight into structural and hydromechanics issues of high-speed crafts and advanced marine vehicles – AMV (catamarans, trimarans, SWATH, SES, WiG, submarines, ROV, AUV).		
Course enrolment requirements and entry competences required for the course	Ship geometry Fluid mechanics. Stability of ships. Ship construction. English language 1 and 2		
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	Students will be able to: - Point out features of various AMVs on examples. - Compare structural and hydro mechanical issues of AMV and monohull displacement ships. - Estimate, preliminary, performance of high-speed craft using commercial software. - Sketch general arrangement of various AMVs.		
Course content broken down in detail by weekly class schedule (syllabus)	Course content	L or S hours	AE hours
	Historic development high-speed crafts and advanced marine vehicles. Overview of design process.	2	
	Categorization of marine vehicles. Design space.	2	
	Overview of features of known types of advanced marine vehicles. Von Karman Gabrielli diagram.	2	
	Structural specifics of high-speed crafts and advanced marine vehicles. Hull materials.	2	
	General arrangement, Structural loads and hydrodynamic performance: fast monohulls.	2	
	General arrangement, Structural loads and hydrodynamic performance: catamarans.	2	
	General arrangement, Structural loads and hydrodynamic performance: hydrofoils and surface effect ships.	2	
	General arrangement, Structural loads and hydrodynamic performance: SWATH and WiG.	2	
	Types of propulsors for advanced marine vehicles.	2	
	Submersibles: types. Working principles.	2	
	Submarines: structure, materials, loads.	2	
	Submarines: stability, hydrodynamics.	2	
	Design procedures for submarines.	2	
	List of laboratory or design exercises		LE or DE hours
	Estimation of performance of known AMV using commercial software.		30

Format of instruction	☒ lectures ☒ seminars and workshops ☒ exercises ☐ *on line* in entirety ☐ partial e-learning ☐ field work	☐ independent assignments ☐ multimedia ☐ laboratory ☐ work with mentor ☒ project (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 assignments (Other)	
	Essay		Seminar essay		(Other)	
	Tests		Oral exam	1	(Other)	
	Written exam		Project	2	(Other)	

Grading and evaluating student work in class and at the final exam	Continuous assessment on lectures, seminars and exercises. Assessment of project task. Oral exam.		
Required literature (available in the library and via other media)	**Title**	**Number of copies in the library**	**Availability via other media**
	McKesson CB. The Practical Design of Advanced Marine Vehicles. College of Engineering, University of New Orleans, 2009.		online
Optional literature (at the time of submission of study programme proposal)	1. Dubrovsky V, Matveev K, Sutulo S. Small Waterplane Area Ships. ISBN13: 978-09742019-3-1. 2. Dubrovsky V. Ships with Outriggers. isbn 0-9742019-0-1. 3. Dubrovsky VA, Lyakhovitsky AG. Multi-Hull Ships. Isbn 09644311-2-2. 4. Burcher R, Rydill L. Concepts in Submarine Design. Cambridge University Press, Ocean Technology Series 2, 1994. ISBN: 0 521 41681 7.		
Quality assurance methods that ensure the acquisition of exit competences	-		
Other (as the proposer wishes to add)			

NAME OF THE COURSE	APPLIED MATHEMATICS							
Code	FEMY02	Year of study	1					
Course teacher	Ivančica Mirošević, Lecturer	Credits (ECTS)	5					
Associate teachers	Lea Dujić, 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	10					

COURSE DESCRIPTION

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

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

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

NAME OF THE COURSE	COMPOSITE SHIPS						
Code	FESS31	Year of study	3				
Course teacher	Branko Blagojević	Credits (ECTS)	5				
Associate teachers	Klement Jadrešić Boris Ljubenkov	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	Insight into materials and structural arrangement of composite ships, types of loads, calculation methods including the rules of classification societies.
Course enrolment requirements and entry competences required for the course	Ship construction. Mechanics of materials. English language.
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	Students will be able to: - Describe purpose of classification societies rules and other regulations related to design and production of composite ships. - Describe function and interaction of structural components and draw structural arrangement. - Design strucutre, after preliminary calculation of loads and responses using the rules of classification societies and other standards and regulations.

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

Course content	L or S hours	AE hours
Overview and basic concepts of composite materials.	2	
Overview of composite hull building technology.	2	
The basics of mechanics of composite materials.	2	
Composite ship construction. Comparison with metal ships.	2	
ISO standars for composite vessels.	2	
Review and comparison of the rules of classification societies.	2	
Load on composite ships.	2	
Types of composite panels. Methods for dimensioning of composite panels. Types of failure.	2	
Types of composite stiffeners. Methods for dimensioning of composite stiffeners. Types of failure.	2	
Connecting components of a composite hull - examples.	2	
Composite panel and stiffener/beam tests.	2	
Visit to the project office.	2	
Visit to shipyard.	2	
List of laboratory or design exercises		AE hours
Project task - dimensioning of structural components according to ISO and DnV GL rules.		

Format of instruction	☒ lectures	☒ independent assignments

	☒ seminars and workshops ☒ exercises ☐ *on line* in entirety ☐ partial e-learning ☒ field work	☐ multimedia ☐ laboratory ☐ work with mentor ☒ project (other)
Student responsibilities		

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

Grading and evaluating student work in class and at the final exam	Continuous assessment on lectures, seminars and exercises. Assessment of project task. Oral exam.

Required literature (available in the library and via other media)	**Title**	**Number of copies in the library**	**Availability via other media**
	Blagojević B. Konstrukcija kompozitnih brodova. Predavanja. 2012.		www.fesb.hr/elearning
	The rules of classification societies / ISO standards		online / Internet

Optional literature (at the time of submission of study programme proposal)	Gerr D. The Elements of Boat Strength. International Marine, McGraw-Hill 2000, ISBN: 0-07-023159-1.
Quality assurance methods that ensure the acquisition of exit competences	-
Other (as the proposer wishes to add)	

NAME OF THE COURSE	COMPUTER AND ENGINEERING GRAPHICS						
Code	FESS01	Year of study	1				
Course teacher	Željko Domazet, Ph. D., Full Professor	Credits (ECTS)	4				
Associate teachers	Miro Bugarin, Ph. D., Teaching assistant, 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: - Create 2D and 3D techical drawings - understand any technical drawing - apply general laws of descriptive geometry - 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	COMPUTER GRAPHICS IN NAVAL ARCHITECTURE						
Code	FESS15	Year of study	3				
Course teacher	Branko Blagojević Dario Ban	Credits (ECTS)	5				
Associate teachers	Josip Bašić	Type of instruction (number of hours)	L	S	AE	LE	DE
			30	0	0	0	30
Status of the course	Mandatory	Percentage of application of e-learning	0				

COURSE DESCRIPTION

Course objectives	Training students for: - Application of computers for 3D modelling in naval architecture (geometry, structure, systems, etc.).		
Course enrolment requirements and entry competences required for the course	Ship geometry English language 1 and 2.		
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	Students will be able to: - Explain advantages and disadvantages of application of computer programs for graphical presentation and modelling of ship systems. - Describe mathematical fundamentals of modern graphic programs and their limitations. - Independently make professional 3D models on computer.		
Course content broken down in detail by weekly class schedule (syllabus)	Course content	L or S hours	AE hours
	Graphic presentation in naval architecture. General information on CAD systems in naval architecture.	2	
	Mathematical foundations of graphic modeling on computers.	2	
	Mathematical foundations of graphic modeling on computers.	2	
	Types of curves and surfaces. Control points. Control nets.	2	
	Continuity and discontinuity.	2	
	Smoothness.	2	
	Curvatures.	2	
	Stiffness of curves and surfaces - impact on models.	2	
	Selection of curves and surfaces for specific modeling purposes.	2	
	Review of 3D modeling programs for naval architecture.	2	
	Review of 3D modeling programs for naval architecture.	2	
	Data formats. Exporting and importing data. Compatibility issues.	2	
	General information for preparing drawings for 3D printing.	2	
	List of laboratory or design exercises		LE or DE hours
	Making 3D models of ship structure, geometry, systems, etc. in various software (individual assignments). Exporting and importing data and corrections.		30

Format of instruction	☒ lectures ☒ seminars and workshops ☒ exercises ☐ *on line* in entirety ☐ partial e-learning ☐ field work		☒ independent assignments ☐ multimedia ☐ laboratory ☐ work with mentor ☐ project (other)			
Student responsibilities						
Screening student work *(name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)*	Class attendance	1	Research		Practical training	
	Experimental work		Report		Individual assignments (Other)	3
	Essay		Seminar essay		(Other)	
	Tests		Oral exam	1	(Other)	
	Written exam		Project		(Other)	
Grading and evaluating student work in class and at the final exam	Continuous assessment on lectures, seminars and exercises. Assessment of individual tasks (oral exam).					

Required literature (available in the library and via other media)	**Title**	**Number of copies in the library**	**Availability via other media**
	Blagojević B. Computer graphics in Naval Architecture. FESB, Split 2016.		online

Optional literature (at the time of submission of study programme proposal)	Software manuals and tutorials.
Quality assurance methods that ensure the acquisition of exit competences	-
Other (as the proposer wishes to add)	

NAME OF THE COURSE	CROATIAN SHIPBUILDING HERITAGE						
Code	FESS17	Year of study	3				
Course teacher	Boris Ljubenkov Dario Ban	Credits (ECTS)	5				
Associate teachers		Type of instruction (number of hours)	P	S	AE	LE	CE
			30	0	30	0	0
Status of the course	Elective	Percentage of application of e-learning	0				
COURSE DESCRIPTION							
Course objectives	Objective of the course is to introduce students with value and significance of shipbuilding heritage in Croatia and in the world in general, with emphasis on shipbuilding in eastern-Adriatic coast.						
Course enrolment requirements and entry competences required for the course	Not exist						
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	– Count influenced centers of shipbuilding heritage in Croatia. – Describe wooden shipbuilding tools. – Reconstruct old boats. – Recognize different wooden shipbuilding schools.						
Course content broken down in detail by weekly class schedule (syllabus)	Content – lectures		L hours				
	Methodologies in heritage research.		2				
	Revitalization of shipbuilding heritage.		2				
	Influence between cities and seas.		2				
	Shipbuilding technology in development of cities.		2				
	Wooden shipbuilding heritage in the world.		2				
	Croatian wooden shipbuilding heritage (General properties of shipbuilding design, shipbuilding tools).		2				
	Shipbuilding in old Dubrovnik.		2				
	Shipbuilding on Korčula (Korkyra Negra).		2				
	Shipbuilding on Vis (Issa).		2				
	Istrian shipbuilding.		2				
	Shipbuilding in central Dalmatia.		2				
	Reconstruction of old boats.		2				
	Seminar, workshop, consultations and presentation for CDIO project.		2				
	Seminar, workshop, consultations and presentation for CDIO project.		2				
	Seminar, workshop, consultations and presentation for CDIO project.		2				

	Content - exercises		AE hours
	Individual and group work on project (CDIO).		30

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, task, tests 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	1	Research		Practical training	
	Experimental work		Report		Individual work	2
	Essay		Seminar essay		Lab exercises	
	Tests		Oral exam		(Other)	
	Written exam		Project	2	(Other)	

Grading and evaluating student work in class and at the final exam	Continuous assessment during class. Course task must be finished before oral exam. Examination: oral exam

Required literature (available in the library and via other media)	**Title**	**Number of copies in the library**	**Availability via other media**
	Various literature regarding project task.		

Optional literature (at the time of submission of study programme proposal)	
Quality assurance methods that ensure the acquisition of exit competences	Student survey in order to evaluate teachers. Occasionally, observation and evaluation of teaching by the Head of Naval Architecture Department.
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="5">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="5">6</td></tr>
<tr><td rowspan="2">Associate teachers</td><td rowspan="2">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="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="6">Course content broken down in detail by weekly class schedule (syllabus)</td><td colspan="4">Course content</td><td>L hours</td><td>AE hours</td></tr>
<tr><td colspan="4">Mission of statics. Force. Axioms of statics. Supports. Reactions of supports.</td><td>2</td><td>1</td></tr>
<tr><td colspan="4">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>3</td></tr>
<tr><td colspan="4">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>2</td></tr>
<tr><td colspan="4">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 coplanar system of couples.</td><td>3</td><td>1</td></tr>
<tr><td colspan="4">Coplanar force system. Theorem about reduction of force about point.</td><td>4</td><td>4</td></tr>
</table>

	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.		
	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.

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

(available in the library and via other media)		**copies in the library**	**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="5">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="5">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="5">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:
- Apply kinematics of the three-dimensional particle motion in various coordinate systems: Cartesian, natural and cylindrical.
- Explain the concepts of displacement, velocity and acceleration as vectors and how to determine them.
- Explain the notion of a force as a vector.
- Explain concepts of kinetic, potential and mechanical energies and the concept of a conservative force.
- Explain concepts of power and mechanical efficiency.
- Apply particle dynamics
- Ability to make a right decision related to a choice of the system of particles whose motion is to be studied.
- Ability to correctly draw the free-body diagram (FBD) for the system.
- Ability to write and solve Newton equations of motion for the system.
- Ability to use principles derived from Newton’s second law, including Work & Energy, and Momentum.
- Apply the kinematics of two-dimensional (planar) rigid-body motion.
- Ability to use concepts of angular displacement, angular velocity and angular acceleration.
- Ability to draw a FBD for a system of rigid bodies.
- Ability to determine mass moment of inertia for body.
- 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.
- 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="4">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">Kinematics of Rectilinear motion.</td><td>2</td><td colspan="2">2</td></tr>
<tr><td colspan="3">Kinematics of Curvilinear motion.</td><td>2</td><td colspan="2">2</td></tr>
<tr><td colspan="3">Bounded motion of particle, 2. Newton law.</td><td>2</td><td colspan="2">2</td></tr>
</table>

	Principle of kinetic energy.	2	2
	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	FEOS02	Year of study	1					
Course teacher	Mira Braović Plavša, senior lecturer	Credits (ECTS)	2					
Associate teachers	-	Type of instruction (number of hours)	L	S	AE	LE	DE	
				30				
Status of the course	Mandatory	Percentage of application of e-learning	0					

COURSE DESCRIPTION

Course objectives	Training students for: - understanding and application of technical vocabulary concerning 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: - Explain basic notions of technical sciences and their branches as well as differences between theoretical and applied sciences - Count and explain mechanical and physical properties of materials - Comment on differences between engineering materials and their uses - Correctly read numbers, units, equations and other mathematical expressions used in engineering - Translate independently less complicated professional texts and interpret tables, diagrams and charts - Use relevant grammar structures (passive, reduced relative clauses, cause and effect clauses, irregular plurals, MLU-s) - Use phrasal expressions to improve English language knowledge		
Course content broken down in detail by weekly class schedule (syllabus)	Course content	S hours	AE hours
	Introduction to the course, U 1 - 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		

<table>
<tr><td>Format of instruction</td><td colspan="6">☐ lectures
☒ seminars and workshops
☐ exercises
☐ on line in entirety
☐ partial e-learning
☐ field work</td><td colspan="2">☒ independent assignments
☐ multimedia
☐ laboratory
☐ work with mentor
☐ (other)</td></tr>
<tr><td>Student responsibilities</td><td colspan="8">The presence on lectures in the amount of at least 70 % of the times scheduled. Performed all required 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="8">There are two midterms and a final exam. The first midterm exam is after 7 weeks of lecturing and the second one is after the next 6 weeks. Students who do not pass both midterm exams have to take the final exam containing learning materials from both midterm exams.

50 % of the test should be solved to have a passing grade. The grade is formed according to the score:

15 % of best solved tests - excellent (5)

35 % of second best solved test - very good (4)

35 % next solved tests - good (3)

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

Students who pass the final test in the third term can get only sufficient grade (2).

Midterm and final exams are carried out according to the academic year calendar.</td></tr>
<tr><td rowspan="4">Required literature (available in the library and via other media)</td><td colspan="5">Title</td><td>Number of copies in the library</td><td>Availability via other media</td></tr>
<tr><td colspan="5">1. Pilković, Mara (1987). English for Students of Mechanical Engineering. Split: FESB.</td><td></td><td></td></tr>
<tr><td colspan="5">2. Morgan, David; Regan, Nicholas (2008). Take-Off. Technical English for Engineering. Reading: Garnet Education.</td><td></td><td></td></tr>
<tr><td colspan="5">3. Cunningham, Sarah; Peter Moor (2000). Cutting Edge. Longman</td><td></td><td></td></tr>
<tr><td>Optional literature (at the time of submission of study programme proposal)</td><td colspan="8">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.</td></tr>
</table>

	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	FEOS04	Year of study	1				
Course teacher	Mira Braović Plavša senior lecturer	Credits (ECTS)	2				
Associate teachers	-	Type of instruction (number of hours)	L	S	AE	LE	DE
				30			
Status of the course	Mandatory	Percentage of application of e-learning	0				

COURSE DESCRIPTION

Course objectives	Training students for: - understanding and application of technical vocabulary concerning 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: - Count types of beams and explain their usage in constructions - Describe mechanical and physical properties of materials - Count and describe various types of welding - Translate independently less complicated professional texts and interpret tables, diagrams and charts - Use relevant grammar structures (passive, reduced relative clauses, cause and effect clauses, irregular plurals, MLU-s) - Use phrasal expressions to improve English language knowledge		
Course content broken down in detail by weekly class schedule (syllabus)	Course content	S hours	AE hours
	Revision of the first term vocabulary and grammar	2	
	Unit 7 Design stress and a factor of safety	2	
	Study section 7- modifiers	2	
	Unit 8 – Beams Study section 8 – relation between two variables	2	
	Unit 9 – Iron Study section 9 – expressions of purpose	2	
	Unit 10 – Steels Study section 10 – results and consequences	2	
	Unit 11 Welding		
	Study section 11 – instructions, advice, descriptions and reports	2	
	First midterm exam		
	Section 1 Introducing naval architecture; passive forms	2	
	Section 2 Types of ships and boats	2	
	Section 3 Tonnage of the ship; reduced relative clauses	2	
	Section 4 Some notions from geometry	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 calenda

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

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	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: - consolidate theoretical knowledge and practical skills in solving problems - use literature, databases and other sources of information - select appropriate methods and procedures for solving practical problems - apply technical knowledge and skills to effectively solve engineering problems - give public presentation, to prepare written report and present project results
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	FLOATING OBJECT OUTFITTING						
Code	FESS30	Year of study	3				
Course teacher	Boris Ljubenkov, Ph. D., Associate Professor	Credits (ECTS)	2				
Associate teachers		Type of instruction (number of hours)	P	S	AE	LE	CE
			30	0	0	0	0
Status of the course	Mandatory	Percentage of application of e-learning	0				

COURSE DESCRIPTION

Course objectives	Objective of the course is to introduce students with standard ship equipment which include outfits for anchoring, mooring, rescuing, steering, cargo handling, fire protection, navigation and ventilation. Students will introduce documentation for ship outfitting.		
Course enrolment requirements and entry competences required for the course	Not exist.		
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	– Explain function and elements of equipment for steering, navigation and rescuing. – Explain function and elements of equipment for anchoring and mooring. – Explain function and elements of equipment for cargo handling of different kind of ships. – Explain function and elements of equipment for fire protection and ventilation. – Create documentation for sections and blocks outfitting. – Create ship outfitting plan according rules and regulations of the classification societies.		
Course content broken down in detail by weekly class schedule (syllabus)	Content	L hours	AE hours
	Introduction in ship equipment. Relations between shipbuilding technology, outfitting and organization.	2	
	Ship outfitting activities and organization. Traditional and modern method of ship outfitting. Outfitting phases and zones.	2	
	Ship functions. Design and economic demands for ship equipment.	2	
	Anchoring equipment. Elements, fabrication and assembly characteristics.	2	
	Mooring equipment. Elements, fabrication and assembly characteristics.	2	
	Rescuing equipment. Elements, fabrication and assembly characteristics.	2	
	Steering equipment. Elements, fabrication and assembly characteristics.	2	
	Liquid cargo handling equipment. Elements, fabrication and assembly characteristics.	2	
	Bulk cargo handling equipment. Elements, fabrication and assembly characteristics.	2	
	General cargo and container handling equipment. Elements, fabrication and assembly characteristics.	2	
	Fire protection equipment and equipment in refrigerant spaces. Elements, fabrication and assembly characteristics.	2	
	Ventilation, heating and air-conditioning equipment. Elements,	2	

	fabrication and assembly characteristics.		
	Ship modular outfitting	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 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	1	Research		Practical training	
	Experimental work		Report		Individual work	
	Essay		Seminar essay		Lab exercises	
	Tests		Oral exam	1	(Other)	
	Written exam		Project		(Other)	

Grading and evaluating student work in class and at the final exam	Continuous assessment during class. Two tests during the semester. Examination: oral exam

Required literature (available in the library and via other media)	**Title**	**Number of copies in the library**	**Availability via other media**
	Markovina, R.: Suvremene metode opremanja broda – skripta- interno izdanje, FESB, 2012.		e-learning
	Čagalj, A.: Oprema broda – skripta, FESB – interno izdanje, 2012.		e-learning
	Ljubenkov, B.: Oprema i opremanje broda – sadržaj i redoslijed predavanja – FESB – interno izdanje, 2015.		e-learning

Optional literature (at the time of submission of study programme proposal)	– Vukičević, B.: Oprema broda, FSB, Zagreb, 1983. – Ozretić, V.: Brodski pomoćni strojevi i uređaji, Split Ship Management Ltd, Split, 1996. – Proceedings of the symposium SORTA – Journal Shipbuilding (Brodogradnja)
Quality assurance methods that ensure the acquisition of exit competences	Student survey in order to evaluate teachers. Occasionally, observation and evaluation of teaching by the Head of Naval Architecture Department.
Other (as the proposer wishes to add)	

NAME OF THE COURSE	FLOATING OBJECTS BUILDING TECHNOLOGY						
Code	FESS24	Year of study	2				
Course teacher	Boris Ljubenkov, Ph. D., Associate Professor	Credits (ECTS)	7				
Associate teachers		Type of instruction (number of hours)	P	S	AE	LE	CE
			45	0	15	30	0
Status of the course	Mandatory	Percentage of application of e-learning	0				

COURSE DESCRIPTION

Course objectives	Objective of the course is to introduce students with the principles of steel ship building. Students will introduce shipbuilding production process from the beginning (steel stockyard) to the ship launching. Also, students will introduce necessary documentation for the ship building.		
Course enrolment requirements and entry competences required for the course	Ship construction		
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	– Explain material flows in the shipbuilding production process. – Describe organization and material transport in the main steel stockyard. – Describe activities for steel preparing, cutting and forming. – Describe function and characteristics of production lines for micro panel and stiffened panel sub-assembly. – Explain activities of sections and blocks sub-assembly. – Describe methods for material corrosion protection in shipbuilding. – Describe activities of hull erection on the building berth. – Describe ship launching technology. – Appreciate section drawings and create technological documentation according the drawings.		
Course content broken down in detail by weekly class schedule (syllabus)	Content - lectures	L hours	
	Development of shipbuilding technology and shipyard organization. Shipbuilding market. World fleet.	3	
	Shipyard development. Domestic and significant world shipyard overview.	3	
	Shipbuilding technological process. Material flows in the shipyard. Types and characteristics of workshops in shipbuilding.	3	
	Materials for ship building. Material storage and transport.	3	
	Material flattening. Material preparing activities.	3	
	Material mechanical, oxy and plasma cutting in shipbuilding.	3	
	Characteristics of machines and production lines for plates and bars cutting in shipbuilding.	3	
	Plates and bars forming in shipbuilding.	3	
	Micro panels, stiffened panel and curved sections sub-assembly.	3	
	Sections and blocks sub-assembly.	3	
	Sections and blocks corrosion protection.	3	
	Ship hull erection methods.	3	
	Energetics and berth staging in shipbuilding.	3	
	Ship launching theory. Launching methods.	3	
	Activities of longitudinal launching.	3	

	Content - exercises		AE hours
	Basis of the shipbuilding technology		2
	Types of documentation in shipbuilding		2
	Technical documentation. Examples		2
	Technological documentation. Examples		3
	Sub-assembly fabrication. Working operations. Production lines		2
	Production lines for stiffened panel		2
	Production lines for curved sections		2
	Content - exercises		LE hours
	Drawing of the 3D model of the ship hull section		9
	Definition of material specification of the ship hull section		6
	Definition of technological documentation for sub-assembly fabrication		4
	Definition of technological documentation for stiffened panel fabrication		4
	Definition of technological documentation for ship section fabrication.		4
	Documentation corrections and report delivery		3

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, task, tests 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	Research		Practical training	
	Experimental work		Report		Individual work	
	Essay		Seminar essay		Lab exercises	
	Tests	2	Oral exam	1	(Other)	
	Written exam		Project	2	(Other)	

Grading and evaluating student work in class and at the final exam	Continuous assessment during class. Two tests during the semester. Course task must be finished before oral exam. Examination: oral exam

Required literature (available in the library and via other media)	**Title**	**Number of copies in the library**	**Availability via other media**
	Sladoljev, Ž: Tehnologija gradnje plovnih objekata - skripta, FSB zagreb, 1987.	1	
	Grubišić, M: Tehnologija gradnje broda, Zagreb, 1986.	1	

	Storch R.L. i autori: Ship Production, SNAME, 2007.	1	
Optional literature (at the time of submission of study programme proposal)	– Zbornici radova simpozija Teorija i praksa brodogradnje – SORTA – Grupa autora: Shiffbautechnologie, Berlin, 1989.		
Quality assurance methods that ensure the acquisition of exit competences	Student survey in order to evaluate teachers. Occasionally, observation and evaluation of teaching by the Head of Naval Architecture Department.		
Other (as the proposer wishes to add)			

NAME OF THE COURSE	FLOATING OBJECTS MAINTENANCE AND REPAIR						
Code	FESS13	Year of study	3				
Course teacher	Jani Barle, Ph. D., Full Professor Boris Ljubenkov, Ph. D., Associate Professor	Credits (ECTS)	5				
Associate teachers	Stipe Perišić, Teaching assistant	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	Main goal is to teach students about basic skills for maintenance and repair floating objects. Student will be introduced to aspects like: quality, reliability, technical condition, classification society requests, organization, preparation, execution and government.		
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. Choose maintenance management and usage profile. 2. Comment on risks associated with usage. 3. Link different reliability and availability modeling concepts. 4. Comment different types of maintenance. 5. Conduct maintenance activities according rules and regulations. 5. Follow efficiency of the maintenance activities.		
Course content broken down in detail by weekly class schedule (syllabus)	Content	L hours	LE hours
	The role and scope of maintenance engineering. Historical aspects, principles and applications of maintenance actions (corrective, preventive, predictive, proactive). Bathtub curve.	2	
	Maintenance-related case studies.		2
	Maintenance assets register, systems and interfaces. 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
	An overview of the failure modes. Human errors in maintenance. Nonparametric life estimate procedures and parametric life models.	2	
	Nonparametric life data analysis procedures - 1.		2
	Reliability and availability data sources, standards and recommendations. Analysis of complete and censored data.	2	
	Nonparametric life data analysis procedures - 2.		2
	Parametric reliability models of component. Constant and time-dependent failure models (Exponential, Weibull, Log-normal). Probability plots. Maximum likelihood. Confidence interval.	2	
	Parametric life data analysis - 1.		2
	Reliability of systems. Reliability block diagrams (RBD): serial configuration and redundancy models.	2	
	Parametric life data analysis - 2.		2
	Maintainability and Availability. Overview of the factors that influences	2	

	maintainability.		
	Maintainability case studies.		2
	Rules and regulations of the Classification Societies. Organization and structure of shipyards for maintenance and repair.	2	
	Characteristic rules and regulations for floating objects maintenace and repair.		2
	Hydro-technical objects for lifting/falling and pulling of floating objects.	2	
	Safety during lifting/falling and pulling of floating objects.		2
	Organization and management of floating objects mainetance.	2	
	Typical organization structures of the shipyards.		2
	Technological characteristics of the floating object hull maintenace and repair: plating and inner structure.	2	
	Maintenance of the floating object hull – examples.		2
	Repair of the ship main engine.	2	
	Examples of the main engine repair.		2
	Repair of the ship equipment. Basic principles of the floating objects conversion. Control, testing and delivery of the repaired floating object.	2	
	Typical damages of the pipe elements. Repair activities.		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:

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

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

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

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

(available in the library and via other media)		**copies in the library**	**other media**
	Barle, J.: Reliability in maintenance management, (student handbook in Croatian: *Pouzdanost u funkciji održavanja tehničkih sustava*), FESB, Split, 2009.		e-learning portal
	Benjakovski, D. Dirst: Tehnologija sudo-remonta, Moskva 1986.	7	
Optional literature (at the time of submission of study programme proposal)	Rausand, M., "Reliability of Safety-Critical Systems: Theory and Applications", Wiley, 2014. Proceedings of the conference SORTA – Theory and practice of shipbuilding Journal Shipbuilding		
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	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: - define the fundamental fluid phenomena, inner and outer forces and stresses in fluids, - recognize and solve forces on general surfaces, - recognize conditions and quote parameters of relative stillness and solve problems, - apply Euler equations of fluid statics, Bernoulli equation, momentum equation and continuity, - explain boundary layer formation, - calculate flow losses in pipes, - recognize hydro- and aerodynamic forces on bodies, - 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.		

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	HYDROSTATICS AND STABILITY						
Code	FESS22	Year of study	2				
Course teacher	Dario Ban, Ph. D., Assistant Professor	Credits (ECTS)	5				
Associate teachers		Type of instruction (number of hours)	L	S	AE	LE	DE
			30	0	0	0	30
Status of the course	Mandatory	Percentage of application of e-learning	0				

COURSE DESCRIPTION

Course objectives	Training students for: learning basics about ship hydrostatics, the methods for calculation of hydrostatics properties and intact ship stability, and the rules of classification societies for approval of ship stability calculations.		
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: - Tell three basic conditions of floatation and identify ship hydrostatic properties. - Describe and apply numerical procedures for preparation of basic ship hydrostatic properties. - Compute intact ship stability properties. - Calculate hydrostatics and stability of intact ship for defined loading conditions (project). - Apply classification societies rules for estimation of calculated ship intact stability results.		
Course content broken down in detail by weekly class schedule (syllabus)	Course content	L or S hours	AE hours
	The basics of ship's hydromechanics.	2	
	Archimed's law. Floatation conditions.	2	
	The calculation of hydrostatics characteristics of immersed ship hull.	2	
	Trim.	2	
	The effects of weight change or shift during loading/unloading on ship centre of gravity and her trim.	2	
	Ship's centration. Inclination test.	2	
	Bonjean curves plan. Hydrostatic particulars diagram.	2	
	Righting levers curve. Static stability, initial stability and metacenter. Elementary stability curves.	2	
	Dynamic stability.	2	
	The stability for large angles. Pantocarene isoclines. Unification of stability calculations.	2	
	Heeling moments.	2	
	The influence of free surface moment on ship stability.	2	
	IMO and Classification societies rules for stability.	2	
	List of laboratory or design exercises		LE or DE hours
	Project.		30

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

Screening student work *(name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)*						
	Class attendance	1	Research		Practical training	
	Experimental work		Report		Individual work	1
	Essay		Seminar essay		Exercises	1
	Tests		Oral exam		(Other)	
	Written exam	1	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**
	Uršić J. Plovnost broda. FSB, Zagreb		
	Uršić J. Stabilitet broda I. FSB, Zagreb		

Optional literature (at the time of submission of study programme proposal)	- Kobylinski L., Kaster S. Stability and Safety of Ships, Elsevier, 2003. - Biran AB. Ship Hydrostatics and Stability. Butterworth-Heinemann 2003. - IMO ship stability rules A749(18).
Quality assurance methods that ensure the acquisition of exit competences	The annual analysis of examination efficacy. Student survey in order to evaluate teachers. Self-evaluation of teachers. Feedback from students who have already graduated from the relevance of the course content. Occasionally, observation and evaluation of teaching by the Head of Naval Architecture Department.
Other (as the proposer wishes to add)	

NAME OF THE COURSE	INTRODUCTION TO COMPUTER APPLICATIONS						
Code	FESY01	Year of study	1.				
Course teacher	Goran Petrović, Ph.D., Associate Professor	Credits (ECTS)	5				
Associate teachers	Josip Vasilj, 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.

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

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

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

NAME OF THE COURSE	MACHINE ELEMENTS							
Code	FESS25	Year of study	2					
Course teacher	Srdjan Podrug, Ph.D., Associate professor	Credits (ECTS)	7					
Associate teachers	Vjekoslav Tvrdić, 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	Training students for: - understanding of machine elements operation principles and designing basis.	
Course enrolment requirements and entry competences required for the course	Engineering graphics	
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	Students will be able to: - Identify the loads imposed on the machine elements. - Evaluate and apply the necessary safety factor. - Select the criteria for sizing and design of machine elements. - Select machine elements based on the criteria. - Compare fasteners, springs and shafts. - Compare power transmissions.	
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. Static strength.	3
	Fatigue strength. S-N (Wohler) diagram. Fatigue (Smith) diagram.	3
	Welded joints: conception, procedures, types, labeling, quality, design, calculation	3
	Threaded fasteners: conception and classification, Standard thread forms, materials. Design of the threaded fasteners. Forces and torque acting in bolted joints.	3
	Strength calculation of the threaded fasteners. Pin bolts and dowel pins. Spline shaft connections. Cylindrical and tapered shaft connections.	3
	Springs: classification, stiffness, work and calculation.	3
	Shafts: conception, materials, design, dimensioning, strength calculation.	3
	Bearings. The theory of hydrodynamic lubrication. Journal slider bearings. Design and calculation of journal slider bearings. Materials for bearings. Thrust slider bearings.	3
	Roller bearings. Types and labels. Dynamic and static load rating. Couplings and clutches. Classification. Rigid couplings. Flexible couplings. Friction clutches.	3
	Power transmissions and mechanical drives. Classification. Features and classification of gear drives.	3
	Main rule of toothing. Geometry of cylindrical gears.	3

	Gear loadings. Pitting load capacity. Tooth root load capacity.	3
	Bevel gears. Worm gear drives. Belt transmissions. Chain transmissions.	3
	List of laboratory or design exercises	LE or DE hours
	Design of the tapered shaft connection and of the welded joint	13
	Design of the shaft	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	4	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.

	Title	**Number of copies in the library**	**Availability via other media**
Required literature (available in the library and via other media)	Podrug, S.: Machine Elements – course materials (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
	Jelaska, D., Piršić, T., Podrug S.: Shaft Design (Directions), FESB, Split 2007. (in Croatian)		e-learning portal
Optional literature (at the time of submission of study	- Jelaska, D: Machine Elements, I part, University of Split, 2007. (in Croatian) - Jelaska, D: Gears and Gear Drives, University of Split, 2011. (in Croatian) - Decker, K.H.: Machine Elements, Tehnička knjiga, Zagreb, 2006. (in Croatian)		

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)	

<table>
<tr><td>NAME OF THE COURSE</td><td colspan="6">MANUFACTURING PROCESSES</td></tr>
<tr><td>Code</td><td>FETS01</td><td>Year of study</td><td colspan="4">2</td></tr>
<tr><td>Course teacher</td><td>Dražen Bajić, Ph. D., Full Professor
Branimir Lela, Ph. D., Assistant Professor</td><td>Credits (ECTS)</td><td colspan="4">6</td></tr>
<tr><td rowspan="2">Associate teachers</td><td rowspan="2">Sonja Jozić, Ph. D., Assistant professor
Jure Krolo, Teaching assistant, Mario Veić, Teaching assistant</td><td rowspan="2">Type of instruction (number of hours)</td><td>L</td><td>S</td><td>AE</td><td>LE</td><td>DE</td></tr>
<tr><td>45</td><td>0</td><td>0</td><td>30</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">10%</td></tr>
<tr><td colspan="7">COURSE DESCRIPTION</td></tr>
<tr><td>Course objectives</td><td colspan="6">Training students for:
- acquisition of basic knowledge of connection between construction, materials and manufacturing processes necessary for successful production in the filed of mechanical engineering and naval architecture
- acquisition of knowledge about the basic technologies: casting, forming by deformation and machining and the possibilities of application of these technologies in the production.</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:

- classify manufacturing engineering technologies,
- clasify casting, metal forming and machining processes,
- explain the importance and characteristics of individual mechanical technologies.
- describe the machines and equipment for particular processes.
- present methods of making models, cores and moulds for casting.
- introduce of determining fluidity alloys and the theoretical foundations of casting solidification.
- discuss about forces, stresses, strains and strain rate in metal forming processes
- describe and explain material flow, friction coeficient, flow stress, work and power in metal formin processes
- comment expressions to calculate the cutting speed, material removal volume, cutting force, power, theoretical roughness and the main machine time for particular machining operations</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">Introduction. Design for manufacturing. The choice of materials and technologies</td><td>3</td><td colspan="2">/</td></tr>
<tr><td colspan="3">Introduction, basic terms in the foundry, history of casting technology. Alloys for casting. Casting patterns, permanent patterns, expendable patterns. Moulds for casting, permanent and expendable moulds, cores</td><td>3</td><td colspan="2">/</td></tr>
<tr><td colspan="3">Casting processes: pressure die casting, centrifugal casting, continous casting, sand casting, precise casting. Tests for fluidity, solidification of metals. Deviations in castings.</td><td>3</td><td colspan="2">/</td></tr>
<tr><td colspan="3">Machining processes. Tool and workpiece motion. Tool geometry.</td><td>3</td><td colspan="2">/</td></tr>
</table>

	Models of chip formation, shape and size of chip. Cutting-tool materials. Quality of machined surface.	3	/
	Machining processes with defined tool edge geometry: turning, planing, drilling, milling, broaching, sawing	3	/
	Machining processes with undefined tool edge geometry: grinding, honing, superfinishing, laping, polishing.	3	/
	First midterm exam		
	Importance and classification of metal forming processes	3	/
	Concept of plastic deformation and indicators of material plasticity	3	/
	Changes in material caused by plastic deformation; Anisotropy	3	/
	Strain and strain rate; Flow stress and flow curves	3	/
	Processes of upsetting, forging, drawing and extrusion	3	/
	Processes of rolling and sheet metal quality testing; Processes of sheet metal bending, deep drawing and stamping	3	/
	Second midterm exam		
	List of laboratory exercises		LE hours
	Permanent and expendable patterns, sand moulds for single use		2
	Introduction to machine tools installed in laboratory. Turning, Tool and workpiece geometry, Chip shapes, Cutting-tools materials		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. Measuring the cutting forces using three component dynamometer		2
	Influence of deformation on mechanical properties; Testing of material flow		2
	Friction coefficient determination by ring upsetting		2
	Flow stress determination by strip upsetting		2
	Testing of material formability by upsetting and forging		2
	Testing of material formability by extrusion		2
	Sheet metal forming; Determination of spring-back during 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	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	
	Experimental work	0,5	Report		Individual work	3
	Essay		Seminar essay		(Other)	
	Tests		Oral exam		(Other)	
	Written exam		Project		(Other)	
Grading and evaluating student	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					

<table>
<tr><td>work in class and at the final exam</td><td colspan="3">that did not pass the midterm exams take part. In the makeup exam students take the entire exam. The midterm, final and makeup exams are carried out as written tests. The requirements for passing grade is:
1. Positive assessment of laboratory exercises
2. 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 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>Duplančić, I.: "Osnove tehnologija", autorizirana predavanja, FESB, Split 2005.</td><td>5</td><td></td></tr>
<tr><td>Bajić, D. “Tehnologije obrade materijala“, autorizirana predavanja.</td><td></td><td>e-learning portal</td></tr>
<tr><td>Živković, D., “Lijevanje metala”, skripta, Sveučilište u Splitu, FESB, Split, 2006.</td><td>5</td><td></td></tr>
<tr><td>Optional literature (at the time of submission of study programme proposal)</td><td colspan="3">- Kalpakjian S.: "Manufacturing Engineering and Technology", Addison - Wesley Publishing Company, 1989.
- Duplančić, I.: Obrada deformiranjem, Sveučilište u Splitu, FESB, Split 2007.
- Math M., “Uvod u tehnologiju oblikovanja deformiranjem”, Sveučilište u Zagrebu, Fakultet strojarstva i brodogradnje, Zagreb, 1999.
- Cebalo, R.: "Obrada odvajanjem čestica", obrađena pitanja i zadaci, Zagreb, 2000.
- Ekinović Š.: "Postupci obrade rezanjem”, Univerzitet u Sarajevu, Mašinski fakultet u Zenici, 2003.
- R. Deželić, Osnove konstrukcijskih materijala, Sveučilište u Splitu, FESB Split, 1996.</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	FESS10	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	2,5	Research		Practical training	
	Experimental work		Report		Individual work	2,2
	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	MARINE PROPULSION SYSTEM						
Code	FESS29	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	Obligatory	Percentage of application of e-learning	0				

COURSE DESCRIPTION

Course objectives	Training students for: - understanding basic principles of marine propulsion system, auxiliary machineries and devices , - understanding application of marine machineries.		
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 propulsion and auxiliary machineries and devices, - recommend main propulsion engine and auxiliary machinery for requested application, energy demand and according to rules and regulation, - choose elements of propulsion system, fuel, oil, cooling systems and exhaust and ventilation system.		
Course content broken down in detail by weekly class schedule (syllabus)	Course content	L or S hours	AE hours
	Marine propulsion systems development. Steam boilers.	2	2
	Marine steam turbines.	2	2
	Marine gas turbines.	2	2
	Marine propulsion engines.	2	2
	Engine combustion.	2	2
	Scavenging and exhaust.	2	2
	Turbochargers.	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, compressors.	2	2

	Propeller systems.	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	2,0	Research		Practical training	
	Experimental work		Report		(Other)	2,7
	Essay		Seminar essay		(Other)	
	Tests	0,2	Oral exam		(Other)	
	Written exam	0,1	Project		(Other)	

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

There are two midterms and final exams. The first midterm exam is after 7 weeks of lecturing and the second one is after the next 6 weeks. In the final exams students that did not pass the midterm exams take part. The midterm and final exams are carried out as written tests (oral 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.

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 propulzijski sustavi		e-learning
	Grljušić M. Pogonski pomorski sustavi. Interna skripta, FESB, 2001.	5	

	Šneller S, Parat Ž. Pogon broda II. Sveučilište u Zagrebu, FSB, 1999.	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	MECHANICS OF MATERIALS						
Code	FESR04	Year of study	1.				
Course teacher	Vedrana Cvitanić, Ph. D., Associate Professor	Credits (ECTS)	6				
Associate teachers	Marko Vukasović, Ph. D., Teaching assistant Maja Kovačić, Teaching assistant	Type of instruction (number of hours)	L	S	AE	LE	DE
			45	0	30	0	0
Status of the course	Obligatory	Percentage of application of e-learning	0				

COURSE DESCRIPTION

Course objectives	Training students 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).		
Course enrolment requirements and entry competences required for the course	Statics (Technical mechanics 1)		
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	Students will be able to: - explain plane stress state and plane strain state as well as stress-strain relationship (Hooke's law), - analyze plane stress state using Mohr's stress circle, - calculate geometrical properties of beam cross sections, - determine stresses and displacements for beams under tension/compression, torsion loading, bending loading or shear loading, - apply allowable stress and allowable strain design procedures to analyze and design simple structures, - solve statically indeterminate problems by using additional deformation conditions, - analyze beams under combined loading using simple failure theories, - summarize problem of column buckling.		
Course content broken down in detail by weekly class schedule (syllabus)	Course content	L hours	AE hours
	Introduction to mechanics of materials. Problems and methods of mechanics of materials. Modelling of structures. Stress vector, normal and shear stress. Stress tensor.	3	2
	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.	3	2
	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.	3	2
	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.	3	2

	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.	3	2
	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

<table>
<tr><td></td><td colspan="3">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 exams is lower than 30, the final grade is determined by absolute system of grading. In this case, the final grade is determemd 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	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	FETS03	Year of study	2.				
Course teacher	Boženko Bilić, Ph.D.,Full Professor	Credits (ECTS)	4				
Associate teachers	Nikola Gjeldum, Ph.D., Assistant Professor	Type of instruction (number of hours)	L	S	AE	LE	DE
			30	0	15	0	0
Status of the course	Obligatory	Percentage of application of e-learning	0				

COURSE DESCRIPTION

Course objectives	Prepare students for work in the operational preparation of shipyards		
Course enrolment requirements and entry competences required for the course	Completed the first year of vocational study of naval architecture or mechanical engineering.		
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	Students will be able to: - Explain the characteristics of discrete and continuous material flows in the production process - Explain the cycle of production and throughput - Classify and explain the components of the processing time - Describe organizational structures - Inventory planning and control - Project planning using project network diagrams (network planning techniques) and gantt charts.		
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	
	The basic principles of manufacturing process design. The basic data required for manufacturing process design. Analysis of technical drawings (of product). The choice of raw material. The choice of manufacturing process, machine tools, tools, tool holders and cutting parameter. Calculation of manufacturing costs.	3	6
	Organizational structures.	2	
	First midterm exam.		
	Inventory planning and control.	6	1
	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	6	6

	planning.					
	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	1,5	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	0	(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 and at least 25% of points achieved at the first midterm. Midterm exams are conducted in written form. They consist of theoretical questions and numerical problems. The teacher reserves the right to hold a midterm exam in oral form. The requirement for passing grade represents minimal 50% points on each midterm exam: Grade (%) = 0,5(M1 + M2) M1 – first midterm grade (%), i.e. percentage points achieved on the first midterm M2 – second midterm grade (%), i.e. percentage points achieved on the second midterm Requirement for access to the final exams is regularly attended classes. In the first two final exams students that did not pass at least one of the midterm exams take part. In the third and fourth final exams students take the whole exam regardless results of midterm exams. Final exams are conducted in written form. They consist of theoretical questions and numerical problems. The teacher reserves the right to hold a final exams in oral form. The requirement for passing grade is positive assessment in exam. Positive assessment represents minimal 50% points on final exam. **Grade (%):** **Final mark:** 50% - 60% sufficient (2) 61% - 75% good (3) 76% - 90% very good (4) 91% - 100% excellent (5) Grade (%) is average points achieved on midterm exams expressed as a percentage or number of points achieved on the final exam expressed as a percentage.					

Required literature (available in the library and via other media)	**Title**	**Number of copies in the library**	**Availability via other media**
	G. Halevi, R. D. Weill: Principles of Process Planning: A logical approach, Chapman & Hall,	0	

	1995.		
	M. Jurković, Dž. Tufekčić: Tehnološki procesi: projektiranje i modeliranje, Mašinski fakultet, Tuzla, 2000.	0	
	I. Veža, B. Bilić, N. Gjeldum, M. Mladineo: Upravljanje projektima (interna skripta), Fakultet elektrotehnike strojarstva i brodogradnje, Split, 2011.		
Optional literature (at the time of submission of study programme proposal)	- B. Bilić: Predavanja postavljena na e-learning portalu FESB-a		
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">PROFESSIONAL TRAINING</td></tr>
<tr><td>Code</td><td>FEYY03</td><td>Year of study</td><td colspan="5">3</td></tr>
<tr><td>Course teacher</td><td>Head of the professional training from the Faculty</td><td>Credits (ECTS)</td><td colspan="5">10</td></tr>
<tr><td rowspan="2">Associate teachers</td><td rowspan="2">Head of the professional training from the private institution</td><td rowspan="2">Type of instruction (number of hours)</td><td>L</td><td>S</td><td>AE</td><td>LE</td><td>DE</td></tr>
<tr><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>Status of the course</td><td>Mandatory</td><td>Percentage of application of e-learning</td><td colspan="5"></td></tr>
<tr><td colspan="8">COURSE DESCRIPTION</td></tr>
<tr><td>Course objectives</td><td colspan="7">Training students for:
- consolidating theoretical knowledge and practical skills in solving highly complex engineering problems
- acquaintance with the organization, work and business of the receiving institution,
- solving practical problems,
- inclusion in the labour market,
- writing technical reports</td></tr>
<tr><td>Course enrolment requirements and entry competences required for the course</td><td colspan="7">Acquired 120 ECTS credits</td></tr>
<tr><td>Learning outcomes expected at the level of the course (4 to 10 learning outcomes)</td><td colspan="7">Students will be able to:
- consolidate theoretical knowledge and practical skills in solving problems
- use literature, databases and other sources of information
- select appropriate methods and procedures for solving practical problems
- apply technical knowledge and skills to effectively solve engineering problems
- prepare a written report on the work results</td></tr>
<tr><td>Course content broken down in detail by weekly class schedule (syllabus)</td><td colspan="7">Professional training is the independent work of the student performed in the receiving institution in accordance with the plan and programme agreed between the head of the professional training from the receiving institution and the head of professional training from the Faculty.</td></tr>
<tr><td>Format of instruction</td><td colspan="3">☐ lectures
☐ seminars and workshops
☐ exercises
☐ on line in entirety
☐ partial e-learning
☒ field work</td><td colspan="4">☒ independent assignments
☐ multimedia
☐ laboratory
☒ work with mentor
☐ (other)</td></tr>
<tr><td>Student responsibilities</td><td colspan="7">Independent work</td></tr>
<tr><td rowspan="6">Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)</td><td>Class attendance</td><td></td><td>Research</td><td></td><td>Practical training</td><td colspan="2">7</td></tr>
<tr><td>Experimental work</td><td></td><td>Report</td><td></td><td>Independent work</td><td colspan="2">2</td></tr>
<tr><td>Essay</td><td></td><td>Seminar essay</td><td></td><td>Report writing</td><td colspan="2">1</td></tr>
<tr><td>Tests</td><td></td><td>Oral exam</td><td></td><td>(Other)</td><td colspan="2"></td></tr>
<tr><td>Written exam</td><td></td><td>Project</td><td></td><td>(Other)</td><td colspan="2"></td></tr>
<tr><td colspan="7"></td></tr>
<tr><td>Grading and evaluating student work in class and at</td><td colspan="7">Professional training is not evaluated. Students are obliged to complete professional training in accordance with the Regulation on professional training and to write a Professional training report. Professional training report is validated by</td></tr>
</table>

<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	PROJECT						
Code	FESS36	Year of study	3				
Course teacher	Dario Ban Branko Blagojević Boris Ljubenkov	Credits (ECTS)	5				
Associate teachers	Josip Bašić Klement Jadrešić	Type of instruction (number of hours)	L	S	AE	LE	DE
			0	30	0	0	30
Status of the course	Mandatory	Percentage of application of e-learning	0				

COURSE DESCRIPTION			
Course objectives	Training students for development of engineering skills regarding preliminary ship design.		
Course enrolment requirements and entry competences required for the course	Ship Hull Forms, English 1, English 2, Mechanics of Materials, Mechanics 1		
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	Students will be able to: - Tell basic methods of ship and maritime object design. - Identify ship properties in early design phase. - Plan and organize the part of ship design project, with applying specific engineering skills. - Work in team on solving practical engineering problems. - Design and present conceptual ship design project, individually and inside the team. - Choose the best communication technique for design presentation, - Critic specific design problems and their solutions.		
Course content broken down in detail by weekly class schedule (syllabus)	Course content	L or S hours	AE hours
	Design methodologies. Identification, analysis and simulation of ship's operative requirements.	2	
	Design process. Design computational methods. Transport problem. Project task.	2	
		2	
		2	
		2	
		2	
		2	
		2	
		2	
		2	
		2	
		2	
		2	
	List of laboratory or design exercises		LE or DE hours
	Solving design problem. Tasks for individual work.		30

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

Screening student work *(name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)*						
	Class attendance	1	Research		Practical training	
	Experimental work		Report		Individual work	2
	Essay		Seminar essay		Exercises	
	Tests		Oral exam		(Other)	
	Written exam		Project	2	(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**
	Literature depending on the design task.		

Optional literature (at the time of submission of study programme proposal)	Literature depending on the design task.
Quality assurance methods that ensure the acquisition of exit competences	The annual analysis of examination efficacy. Student survey in order to evaluate teachers. Self-evaluation of teachers. Feedback from students who have already graduated from the relevance of the course content. Occasionally, observation and evaluation of teaching by the Head of Naval Architecture Department.
Other (as the proposer wishes to add)	

NAME OF THE COURSE	RULES AND SURVEY IN SHIPBUILDING						
Code	FESS36	Year of study	3				
Course teacher	Dario Ban	Credits (ECTS)	5				
Associate teachers		Type of instruction (number of hours)	P	S	AE	LE	CE
			30	0	30	0	0
Status of the course	Elective	Percentage of application of e-learning	0				

COURSE DESCRIPTION

Course objectives	Objective of the course is to introduce students with basic knowledge from the filed of classification and approval process for shipbuilding design and construction documents, as well as survey and testing of construction details, machinery and equipment on ship.		
Course enrolment requirements and entry competences required for the course	Ship Construction		
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	– Describe terms regarding Quality, Reliability and Technical condition of marine objects. – Prepare list of necessary documentation for classification and approval of ship's technical documentation. – Count measuring equipment for survey of ship hull construction and its equipment.		
Course content broken down in detail by weekly class schedule (syllabus)	Content – lectures	L hours	
	Quality, Reliability and Technical condition of marine objects.	2	
	Classification societies and their requirements.	2	
	Classification societies in the world.	2	
	Norms and classification rules in the world.	2	
	Classification societies organization and their tasks.	2	
	Contents and making of technical documentation for ships.	2	
	Types of malfunctions and errors on ship hull construction and its equipment.	2	
	Characteristics of shipbuilding process, organization and structure of shipyard for building and reconstruction of marine objects.	2	
	Measuring equipment for shipbuilding structure survey.	2	
	Preparation, organization and control of certification process for approval of technical documentation.	2	
	Relationship ship owner-classification society-shipyard	2	
	Seminar, workshop, consultations and presentation for CDIO project.	2	
	Seminar, workshop, consultations and presentation for CDIO project.	2	

	Field trip to classification society Croatian Register of Shipping.	2	
	Field trip to shipyard.	2	
	Content - exercises		AE hours
	Individual and group work on project (CDIO).		30

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, task, tests 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	1	Research		Practical training	
	Experimental work		Report		Individual work	2
	Essay		Seminar essay		Lab exercises	
	Tests		Oral exam		(Other)	
	Written exam		Project	2	(Other)	

Grading and evaluating student work in class and at the final exam	Continuous assessment during class. Course task must be finished before oral exam. Examination: oral exam

Required literature (available in the library and via other media)	**Title**	**Number of copies in the library**	**Availability via other media**
	Rules for building ships, CRS		
	Rules for building ships, DnV		
	Rules for building ships, LR		

Optional literature (at the time of submission of study programme proposal)	IMO Rules.
Quality assurance methods that ensure the acquisition of exit competences	Student survey in order to evaluate teachers. Occasionally, observation and evaluation of teaching by the Head of Naval Architecture Department.
Other (as the proposer wishes to add)	

NAME OF THE COURSE	Ship Construction						
Code	FESS21	Year of study	2				
Course teacher	Branko Blagojević	Credits (ECTS)	5				
Associate teachers	Paul Jurišić	Type of instruction (number of hours)	L	S	AE	LE	DE
			30	0	0	0	30
Status of the course	Mandatory	Percentage of application of e-learning	20				

COURSE DESCRIPTION

Course objectives	Training students for: – Understanding function of ship structural components and whole structure, scantlings calculation using the rules of classification societies and international regulations.		
Course enrolment requirements and entry competences required for the course	Ship geometry Technical Mechanics 1 Mechanics of materials English language 1 and 2		
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	Students will be able to: - Illustrate design principles on examples. - Determine scantling of structural components using the rules of classification societies and taking into account international regulations. - Distinguish loads on ship structures. - Explain procedure for calculation of longitudinal strength. - Estimate wave loads for a given ship. - Construct midship section and longitudinal cross-section for a given ship.		
Course content broken down in detail by weekly class schedule (syllabus)	Course content	L or S hours	AE hours
	The role of classification societies. International organizations and conventions. Technical rules.	2	
	Technical documentation. Terminology. Overview of ship types.	2	
	Basic building elements. Systems of structural arrangement (longitudinal, transverse, mixed, combination).	2	
	Overview of loads on ship structures.	2	
	Overview of failure modes.	2	
	Bottom structure.	2	
	Shell plating.	2	
	Side structure. Framing.	2	
	Deck structures. Hatches.	2	
	Bulkheads. Structural tanks. Superstructure.	2	
	Fore and aft structure.	2	
	Engine room structure.	2	
	Rudder structure.	2	
	List of laboratory or design exercises		LE or DE hours
	Project: for a given ship construct and draw midship section and longitudinal cross-section using the rules of classification societies.		30

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

Screening student work *(name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)*						
	Class attendance	2	Research		Practical training	
	Experimental work		Report		(Other)	
	Essay		Seminar essay		(Other)	
	Tests		Oral exam	0,5	(Other)	
	Written exam	0,5	Project	2	(Other)	

Grading and evaluating student work in class and at the final exam	Continuous assessment on lectures and exercises. Assessment of project (oral exam). Written exam.

Required literature (available in the library and via other media)	**Title**	**Number of copies in the library**	**Availability via other media**
	Žiha K. Ship construction, FSB, Zagreb, 2010.		online
	B.Blagojević. Ship structural design. Lectures. FESB, 2014.		online

Optional literature (at the time of submission of study programme proposal)	- Eyres DJ. Ship Construction. 7th ed. Butterworth-Heinemann, 2005. ISBN-10: 0750680709. - Grubišić M. Ship Construction. FSB Zagreb, 1980.
Quality assurance methods that ensure the acquisition of exit competences	-
Other (as the proposer wishes to add)	

NAME OF THE COURSE	SHIP HULL FORMS						
Code	FESS20	Year of study	1				
Course teacher	Dario Ban, Ph. D., Assistant Professor	Credits (ECTS)	5				
Associate teachers	Josip Bašić, Teaching assistant	Type of instruction (number of hours)	L	S	AE	LE	DE
			30	0	0	0	30
Status of the course	Mandatory	Percentage of application of e-learning	0				

COURSE DESCRIPTION

Course objectives	Training students for: learning about basic ship terminology, her geometry of outer and inner compartments, and tools and methods for her manual and computer based drawing.		
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: - Write basic terminology of ship as technical object. - Correct use of basic terminology in ship geometry. - Describe and apply the procedure for development of technical lines plan drawing. - Apply computer program for 3D drawing of ship hull form (project).		
Course content broken down in detail by weekly class schedule (syllabus)	Course content	L or S hours	AE hours
	On ship geometry.	2	
	Basic terminology about Ship hull form.	2	
	Representation of ship's hull forms.	2	
	Lines plan.	2	
	Ship hull form coefficients.	2	
	Basic properties of ship hull forms.	2	
	Modification of Ship hull forms. Affine and non-affine transformations.	2	
	3D ship hull form representation.	2	
	Geometries of ship hulls.	2	
	The basics of mathematical description of hull forms.	2	
	Polynomial description of hull forms.	2	
	Geometric properties of curves and surfaces.	2	
	The basics of CAD systems in shipbuilding.	2	
	List of laboratory or design exercises		LE or DE hours
	Project. Exercises with independent assignments.		30
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		

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	0.5
	Essay		Seminar essay	0.5	Design exercises	1
	Tests		Oral exam		(Other)	
	Written exam	1	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**
	Ban D. Geometrija broda. Internal script-unpublished (Croatian).		https://elearning.fesb.unist.hr
	Grubišić I. Geometrija broda. Digital udžbenik, FSB Zagreb.		www.fsb.hr/geometrija.broda/
	Blagojević B. Modeliranje forme broda pomoću računala. Materials for exercises, 2011.		https://elearning.fesb.unist.hr

Optional literature (at the time of submission of study programme proposal)	- Markovina R. Geometrija broda. Internal script-unpublished (Croatian). - Maxsurf User Manual. Bentley Engineering, 2016.
Quality assurance methods that ensure the acquisition of exit competences	The annual analysis of examination efficacy. Student survey in order to evaluate teachers. Self-evaluation of teachers. Feedback from students who have already graduated from the relevance of the course content. Occasionally, observation and evaluation of teaching by the Head of Naval Architecture Department.
Other (as the proposer wishes to add)	

NAME OF THE COURSE	SHIP HYDRODYNAMICS						
Code	FESS28	Year of study	3				
Course teacher	Branko Blagojević	Credits (ECTS)	6				
Associate teachers	Josip Bašić	Type of instruction (number of hours)	L	S	AE	LE	DE
			45	0	0	0	30
Status of the course	Mandatory	Percentage of application of e-learning	0				

COURSE DESCRIPTION

Course objectives	Training students for: - understanding ship resistance and propulsion.		
Course enrolment requirements and entry competences required for the course	Ship geometry Fluid mechanics. Stability of ships. English language 1 and 2		
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	Students will be able to: - Describe ship resistance components. - Calculate ship resistance using empiric methods. - Select a propeller and a main engine for a given ship by applying Bp-delta and Crouch methods. - Describe ship motions.		
Course content broken down in detail by weekly class schedule (syllabus)	Course content	L or S hours	AE hours
	Historic development of ship hydrodynamics. Methods for estimation of ship resistance.	3	
	Ship propulsion system. Components of ship power prediction. Propulsion efficiency.	3	
	Sail regimes. Ship resistance components. Froude approach.	3	
	Friction resistance. Residual resistance.	3	
	Viscous resistance.	3	
	Wave resistance.	3	
	Other resistances. Calculation methods.	3	
	Ship propulsion terminology. Types of propulsors. Propeller geometry. Propeller design. Propeller strength.	3	
	Wake. Cavitation. Propeller calculation methods.	3	
	Power prediction procedure. Selection of main engine and propeller.	3	
	Ship motions.	3	
	Seakeeping.	3	
	Maneuverability.	3	
	List of laboratory or design exercises		LE or DE hours
	Procedures for calculation of resistance (application of commercial software). Selection of propeller and main engine for a given ship.		30
Format of instruction	☒ lectures	☒ independent assignments	

	☒ seminars and workshops ☒ exercises ☐ *on line* in entirety ☐ partial e-learning ☐ field work	☐ multimedia ☐ laboratory ☐ work with mentor ☐ project (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 assignments (Other)	2
	Essay		Seminar essay		(Other)	
	Tests		Oral exam	1	(Other)	
	Written exam	1	Project		(Other)	

Grading and evaluating student work in class and at the final exam	Continuous assessment on lectures, seminars and exercises. Assessment of individual tasks (oral exam). Written exam.		
Required literature (available in the library and via other media)	**Title**	**Number of copies in the library**	**Availability via other media**
	Blagojević B. Ship hydrodynamics. Lectures. FESB, 2010.		online
Optional literature (at the time of submission of study programme proposal)	5. Vučinić A. Ship Hydrodynamics: Resistance. Sveučilište u Rijeci, Tehnički fakultet, 1997. 6. Van Lameren, W. P. A., "Resistance and propulsion of ships", Brodarski institut, Zagreb, 1952. 7. Molland. Ship Resistance and propulsion. 2010.		
Quality assurance methods that ensure the acquisition of exit competences	-		
Other (as the proposer wishes to add)			

NAME OF THE COURSE	SHIPBUILDING MATERIALS						
Code	FESS26	Year of study	2				
Course teacher	Nikša Krnić, Ph. D., Associate professor	Credits (ECTS)	4				
Associate teachers	Domagoj Kojundžić, Teaching Assistant	Type of instruction (number of hours)	L	S	AE	LE	DE
			30			15	
Status of the course	Obligatory	Percentage of application of e-learning	40				

COURSE DESCRIPTION

Course objectives	Course objectives are to teach the students the basic and applicative knowledges about features, characteristics, specifics, requirements and properties of typical structural engineering materials for shipbuilding and maritime applications as well as to introduce the students in materials manufacturing methods.	
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)	Upon successful course completion students will be able to: - classify main groups of engineering materials, - enumerate basic material properties, behaviour and shipbuilding applications, - apply the classification societies' regulations regarding materials and their selection, - enumerate and describe basic testing methods for shipbuilding materials.	
Course content broken down in detail by weekly class schedule (syllabus)	Course content	L hours
	Historical development of and main types of materials used for shipbuilding. Service conditions in marine environment and requirements on shipbuilding materials.	2
	Classes, production, properties and application examples of normal and higher strength shipbuilding steels. Weldability of shipbuilding steels. Cast iron.	7
	Other non-alloyed, low-alloyed, high alloyed steels for high and low temperature shipbuilding applications. Corrosion issues and corrosion-resistant steels for shipbuilding applications.	2
	Classification, properties and typical shipbuilding applications of aluminium ant its alloys. Principles of precipitation hardening on the example of shipbuilding aluminium alloy.	3
	Classification, properties and typical shipbuilding applications of titanium ant its alloys. Short overview of other relevant non-ferrous alloys for shipbuilding application – copper, magnesium and nickel.	3
	Classification, production, properties and typical application of polymer materials in shipbuilding.	2
	Classification, production, properties and typical application of ceramic materials and glasses in shipbuilding.	2
	Basics of composite materials structure, features, properties and manufacturing. Polymer based composite materials for shipbuilding application.	3
	Novel and specific materials for shipbuilding application - foams, reinforced concrete, plated and laminated materials, natural materials.	1
	Classification societies and requirements on shipbuilding materials.	1
	List of laboratory exercises	LE hours
	Metallography of A and D class of shipbuilding steels. Practical impact toughness and tensile testing.	2
	Presentation of mechanical properties of shipbuilding steel welded joint.	1

	Precipitation hardening of aluminium alloys for shipbuilding application.	2
	Demonstration of heat effects on titanium.	1
	Practical manufacturing of layered glass reinforced polymer matrix composite by hand layup.	3
	Practical manufacturing of layered glass, carbon or hybrid reinforced polymer matrix composite by vacuum bagging.	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	Mandatory minimal attendance 70 % for the lectures and 85 % for lab exercises. Preparation and submission of reports from 100 % laboratory exercises are obligatory. Reports from every lab exercise have to be approved.	

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	0,5
	Experimental work		Report		Individual work	1,5
	Essay		Seminar essay	0,5	Laboratory exercises	
	Tests		Oral exam		(Other)	
	Written exam		Project		(Other)	

Grading and evaluating student work in class and at the final exam	There are the two written midterm or partial exams in regular terms during the semester (after 7 weeks and the second is after 15 weeks) each encompassing approximately 1/2 of thought course topics. Students who successfully complete both midterm exams are administered to short oral check before course completion. Unsuccessful termination of one or more partial exams qualifies students for final written exam and oral check. Final grade is formed primarily upon the success on midterm partial written exams or on final written exam and on oral check. Regularity of student's attendance of lectures and exercises and quality of laboratory exercises reports influence the final grade if this is in between. The prerequisites for a positive grade are 50% points on each midterm or on the written exam. Grading policy is according to the following scheme: sufficient (2) for 50 % to 61 % of total points, good (3) for 62 % to 74 %, very good (4) for 75 % to 87 % and excellent (5) for 88 % and more of total points. Examination terms are according to the FESB schedule announced regularly at the beginning of the academic year.

Required literature (available in the library and via other media)	**Title**	**Number of copies in the library**	**Availability via other media**
	Duplančić I., Krnić N.: Materijali 3, recommended chapters, Sveučilište u Splitu, FESB, Split 2009.		
	Krnić, N.: Textbook and presentations on Shipbuilding Materials, from 2007. onwards		
	Duplančić, I.: Materijali 2, recommended chapters, Sveučilište u Splitu, FESB, Split 2008.		
	Croatian Register of Shipping, LR of Shipping, DnV, Burreau Veritas, ABS: Rules, Regulations and Norms dealing with materials		
	Žiha K.: Sveučilište u Zagrebu, FSB		

Optional literature (at the time of submission of study programme	Other publications in Croatian and English language and selected WEB sites dealing with metallic and other types of engineering materials like Inženjerski priručnik, Tehnička enciklopedija, other textbooks on this topic

proposal)	
Quality assurance methods that ensure the acquisition of exit competences	- Encourage students to attend the lectures and exercises and to control it - 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	SHIPBUILDING PROCESS ORGANIZATION						
Code	FESS34	Year of study	3				
Course teacher	Boris Ljubenkov	Credits (ECTS)	5				
Associate teachers		Type of instruction (number of hours)	P	S	AE	LE	CE
			30	0	30	0	0
Status of the course	Mandatory	Percentage of application of e-learning	0				

COURSE DESCRIPTION			
Course objectives	Objective of the course is to introduce students with significance of organization in complex production systems like shipbuilding process. Students will introduce organization principles and structures, shipyard business models, business financial measures and tasks of the shipbuilding preparing process.		
Course enrolment requirements and entry competences required for the course	Not exist		
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	– Explain organization principles and structures. – Explain shipyard business models. – Describe material management methods in shipbuilding. – Explain types of costs in shipbuilding process. – Apply principles of production engineering in shipbuilding – Explain characteristics of technical and technological drawing in shipbuilding – Explain phases of planning in shipbuilding production process – Create an project plan using Critical Path Method		
Course content broken down in detail by weekly class schedule (syllabus)	Content - lectures	L hours	
	Introduction to organization. Organization development.	2	
	Organization principles. Basic models of the organization structures.	2	
	Shipbuilding process characteristics and organization.	2	
	Business – definition and characteristics. Financial result. Success index. Shipyard business collaboration.	2	
	Business policy types. Business functions. Characteristics of the shipbuilding market.	2	
	Characteristics of the shipyard business models.	2	
	Types and characteristics of ownerships. Product division and encryption.	2	
	Material management in shipbuilding.	2	
	Business resources – types and characteristics. Costs. Types of costs in shipbuilding process.	2	
	Tasks of shipbuilding preparing process. Influence of the technology on shipbuilding preparing process.	2	
	Production engineering in a modern shipyard.	2	
	Technical documentation – documents for negotiation	2	
	Technical documentation – design, workshop and delivery documents	2	
	Technological documentation – design and workshop documents.	2	
	Shipbuilding production planning – tasks and characteristics of long term, basic and operational planning	2	
	Content - exercises		AE hours

	Planning in the shipbuilding preparing and production process		2
	Basics of the Network Planning Technique		4
	Theoretical basis of the Critical Path Method		6
	Critical Path Method - example		6
	Critical Path Method – task for students		8
	Tasks corrections and delivery		4

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, task, tests 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	1	Research		Practical training	
	Experimental work		Report		Individual work	
	Essay		Seminar essay		Lab exercises	
	Tests	2	Oral exam	1	(Other)	
	Written exam		Project	1	(Other)	

Grading and evaluating student work in class and at the final exam	Continuous assessment during class. Two tests during the semester. Course task must be finished before oral exam. Examination: oral exam

Required literature (available in the library and via other media)	**Title**	**Number of copies in the library**	**Availability via other media**
	Sladoljev, Ž.: Organizacija i poslovanje brodogradilišta – skripta, FSB Zagreb, 2000.	1	
	Bruce G. J.: The business of shipbuilding, LPP limited, London, 2001.	1	
	Ljubenkov, B.: Organizacija i poslovanje brodogradilišta- sadržaj i raspored predavanja, FESB, 2013.		e-learning

Optional literature (at the time of submission of study programme proposal)	– Vidović, I.: Upravljanje troškovima, Brodogradnja 49, (2001)2, str.191-203. – Proceedings of the Symposium SORTA
Quality assurance methods that ensure the acquisition of exit competences	Student survey in order to evaluate teachers. Occasionally, observation and evaluation of teaching by the Head of Naval Architecture Department.
Other (as the proposer wishes to add)	

NAME OF THE COURSE	SPECIAL MATERIALS AND BUILDING TECHNOLOGIES						
Code	FESS32	Year of study	3				
Course teacher	Boris Ljubenkov, Ph. D., Associate Professor	Credits (ECTS)	5				
Associate teachers		Type of instruction (number of hours)	P	S	AE	LE	CE
			30	0	30	0	0
Status of the course	Elective	Percentage of application of e-learning	0				

COURSE DESCRIPTION

Course objectives	Objective of the course is to introduce students with the principles of composite, aluminum and stainless steel ship building.
Course enrolment requirements and entry competences required for the course	Not exist.
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	– Describe components of composite materials which are used in a modern shipbuilding – Explain advantages of composite materials usage in shipbuilding – Explain methods for composite material choice according classification society demands. – Explain methods for measuring mechanical characteristics of the composites – Make specimens for different kind of material testing – Describe characteristics of aluminum alloys which are used in shipbuilding – Explain aluminum shipbuilding technology – Describe characteristics of stainless steel which are used in shipbuilding – Explain technological specificities of stainless steel ship building

Course content broken down in detail by weekly class schedule (syllabus)	Content	L hours	
	Introduction in composites. Composites in shipbuilding.	2	
	Composite materials. Fibers and resins.	2	
	Characteristics of the fibers and resins which are usually in shipbuilding.	2	
	Sandwich structures and characteristics.	2	
	Composite production methods – hand lay up	2	
	Composite production methods – vacuum infusion	2	
	Composite production methods comparison	2	
	Classification rules and regulations for composite ship building	2	
	Composite material testing methods	2	
	Aluminum alloys used in shipbuilding characteristics	2	
	Aluminum cutting, forming and welding	2	
	Aluminum ship building technology	2	
	Stainless steel used in shipbuilding characteristics	2	
	Stainless steel cutting, forming and welding	2	
	Stainless steel ship building technology	2	
	Content		AE Hour
	Materials for composite production. Theory of hand lay up method.		2
	Laminate and sandwich structure production by hand lay up method.		2

	Materials for composite production. Theory of vacuum infusion method.		2
	Laminate and sandwich structure production by vacuum infusion method.		2
	Work on project. Project presentation.		22

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; work on project and 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	Research	1	Practical training	
	Experimental work		Report		Individual work	2
	Essay		Seminar essay		Lab exercises	
	Tests		Oral exam	1	(Other)	
	Written exam		Project		(Other)	

Grading and evaluating student work in class and at the final exam	Continuous assessment during class. Two tests during the semester. Project presentation. Examination: oral exam

Required literature (available in the library and via other media)	**Title**	**Number of copies in the library**	**Availability via other media**
	Hull D.: An introduction to composite materials, Cambridge University Press, Cambridge, 1981.	1	
	Greene E.: Marine Composites, Eric Greene Associates, 1999.	1	
	Pollard S.F.: Boatbuilding with Aluminum, International Marine Camden, Maine, 1993.	1	

Optional literature (at the time of submission of study programme proposal)	– Barbero E.J.: Introduction to composite materials design, CRC Press, 2011. – Gurit: Guide to Composites, www.gurit.com – Journal of Shipbuilding
Quality assurance methods that ensure the acquisition of exit competences	Student survey in order to evaluate teachers. Occasionally, observation and evaluation of teaching by the Head of Naval Architecture Department.
Other (as the proposer wishes to add)	

NAME OF THE COURSE	STRENGTH OF SHIPS						
Code	FESS23	Year of study	2.				
Course teacher	Frane Vlak, Ph. D., Associate Professor	Credits (ECTS)	8				
Associate teachers	Branka Bužančić Primorac, Ph. D., Teaching assistant	Type of instruction (number of hours)	L	S	AE	LE	DE
			45	0	30	0	15
Status of the course	Obligatory	Percentage of application of e-learning	0				

COURSE DESCRIPTION

Course objectives	Training students for: - understanding and application of fundamentals in structural analysis of ship structure, - introducing to analysis and calculations of the ship structures using theories of thin-walled structures.		
Course enrolment requirements and entry competences required for the course	Mechanics of materials and Ship structures.		
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	Students will be able to: - explain the fundamentals of the energy methods, - explain the force method, - apply the force method in the analysis of frames and grillages, - explain the influence of shear on the beam bending, - explain the method of ship longitudinal strength calculation, - apply the solutions for bending of thin plates in the analysis of the ship plating.		
Course content broken down in detail by weekly class schedule (syllabus)	Course content	L hours	AE hours
	Generalised forces and displacements. Flexibility coefficients. Flexibility matrix.	3	3
	Betti's theorem, Maxwell's theorem, and Castigliano's 2nd theorem. Theorem of the minimum of the potential energy.	3	3
	Mohr's integral. Vereschagino's rule.	3	3
	Beam structures.	3	3
	Statical indeterminacy of structures.	3	3
	Force method.	3	3
	Method of initial parameters.	3	3
	First midterm exam		
	Theory of the bending with influence of shear.	3	3
	Transverse strength of ships (frames).	3	3
	Local strength of ships (grillages).	3	3
	Longitudinal strength of ships.	3	3
	Thin rectangular plates.	3	3
	Stability of the parts of ship structures.	3	3
	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)	

<table>
<tr><td>Student responsibilities</td><td colspan="6">The presence on lectures in the amount of at least 70 % of the times scheduled. Performed all required laboratory exercises.</td></tr>
<tr><td rowspan="6">Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)</td><td>Class attendance</td><td>3,0</td><td>Research</td><td>1</td><td>Practical training</td><td></td></tr>
<tr><td>Experimental work</td><td></td><td>Report</td><td></td><td>Individual work</td><td>2</td></tr>
<tr><td>Essay</td><td></td><td>Seminar essay</td><td>0,8</td><td>Laboratory exercises</td><td></td></tr>
<tr><td>Tests</td><td>0,2</td><td>Oral exam</td><td></td><td>Preparation for laboratory exercises</td><td></td></tr>
<tr><td>Written exam</td><td>0,2</td><td>Project</td><td>0,8</td><td>(Other)</td><td></td></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>Grading and evaluating student work in class and at the final exam</td><td colspan="6">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(%) = 0,45 (M1 + M2) + 0,1S
the activities in percentage:
• M1, M2 – test results,
• S - seminar essey.</td></tr>
<tr><td rowspan="8">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">R. Pavazza: Uvod u analizu tankostjenih štapova, Kigen, Zagreb 2007.</td><td></td><td colspan="2"></td></tr>
<tr><td colspan="3">J. Uršić: Čvrstoća broda I, Fakultet strojarstva i brodogradnje, Zagreb, 1972.</td><td></td><td colspan="2"></td></tr>
<tr><td colspan="3">J. Uršić: Čvrstoća broda II, Fakultet strojarstva i brodogradnje, Zagreb,1983.</td><td></td><td colspan="2"></td></tr>
<tr><td colspan="3">J. Uršić: Čvrstoća broda III, Fakultet strojarstva i brodogradnje, Zagreb,1992.</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 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">- Det Norske Veritas: Load & Strength, 1977.
- Hughes, O. F.: Ship Structural Design, John Whiley & Sons, New York, 1983.</td></tr>
<tr><td>Quality assurance methods that ensure the acquisition of exit competences</td><td colspan="6">- Evaluation of results in accordance with the above learning outcomes
- Feedback from students via surveys
- Self-evaluation of teachers
- Institutional and non-institutional evaluations</td></tr>
<tr><td>Other (as the proposer wishes to add)</td><td colspan="6"></td></tr>
</table>

NAME OF THE COURSE	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: - explain the basic concepts and laws of thermodynamics - apply the concepts and laws of thermodynamics to the different types of a simple technical energy process - calculate the mass balance and simple balance of different types of energy flows - calculate the efficiency of the process and energy systems - 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">- I. Ninić, Uvod u termodinamiku i njene tehničke primjene, Sveučilište u Splitu, 2007.
- 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	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	0	0	15	0
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)			

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
Advanced Marine Vehicles	Branko Blagojević, Ph. D., Full Professor Josip Bašić, Teaching assistant
Applied Mathematics	Ivančica Mirošević, Lecturer Lea Dujić, Teaching assistant
Composite Ships	Branko Blagojević Klement Jadrešić Boris Ljubenkov
Computer and Engineering Graphics	Željko Domazet, Ph. D., Full Professor, Miro Bugarin, Ph. D., Assistant Professor Ivan Špar, Dejan Bobić, Joško Kunac, Petra Bagavac, Teaching Assistants
Computer Graphics in Naval Architecture	Branko Blagojević, Ph. D., Full Professor Dario Ban, Ph. D., Assistant Professor Josip Bašić, Teaching assistant
Croatian Shipbuilding Heritage	Boris Ljubenkov, Ph. D., Associate Professor Dario Ban, Ph. D., Assistant Professor
Engineering Mechanics 1	Vedrana Cvitanić, Ph. D., Associate Professor Marko Vukasović, 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
Floating Object Outfitting	Boris Ljubenkov, Ph. D., Associate Professor
Floating Objects Building Technology	Boris Ljubenkov, Ph. D., Associate Professor

Floating Objects Maintenance and Repair	Jani Barle, Ph. D., Full Professor Boris Ljubenkov, Ph. D., Associate Professor Stipe Perišić, Teaching assistant
Fluid Mechanics	Branko Klarin, Ph. D., Full Professor Maja Zore, Teaching assistant
Hydrostatics and Stability	Dario Ban, Ph. D., Assistant Professor
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	Srdjan Podrug, Ph.D., Associate professor Vjekoslav Tvrdić, Teaching assistant
Manufacturing Processes	Dražen Bajić, Ph. D., Full Professor Branimir Lela, Ph. D., Assistant Professor Sonja Jozić, Ph. D., Assistant professor Jure Krolo, Teaching assistant, 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
Marine Propulsion System	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
Mechanics of Materials	Vedrana Cvitanić, Ph. D., Associate Professor Marko Vukasović, Ph. D., Teaching assistant Maja Kovačić, Teaching assistant
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
Professional Training	Head of the professional training from the Faculty Head of the professional training from the private institution

Project	Dario Ban, Ph. D., Assistant Professor Branko Blagojević, Ph. D., Full Professor Boris Ljubenkov, Ph. D., Associate Professor
Rules and Survey in Shipbuilding	Dario Ban, Ph. D., Assistant Professor
Ship Construction	Branko Blagojević, Ph. D., Full Professor Paul Jurišić, Ph. D., Teaching assistant
Ship Hull Forms	Dario Ban, Ph. D., Assistant Professor Josip Bašić, Teaching assistant
Ship Hydrodynamics	Branko Blagojević, Ph. D., Full Professor Josip Bašić, Teaching assistant
Shipbuilding Materials	Nikša Krnić, Ph.D., Associate professor
Shipbuilding Process Organization	Boris Ljubenkov, Ph. D., Associate Professor
Special Materials and Building Technologies	Boris Ljubenkov, Ph. D., Associate Professor
Strength of Ships	Frane Vlak, Ph. D., Associate Professor Branka Bužančić Primorac, Ph. D., Teaching assistant
Thermodynamics	Frano Barbir, Ph. D., Full Professor Ivan Tolj, Ph. D., Teaching assistant
Welding and Similar Treatments	Nedjeljko Mišina, Ph.D., Full Professor Zvonimir Dadić, Teaching assistant

3.3. Curriculum vitae of the course teacher

First and last name and title of teacher	**Mira Braović Plavša senior lecturer**
The course he/she teaches in the proposed study programme	English Language 1 and English Language 2 for students of Mechanical Engineering English Language 1 and English Language 2 for students of Naval Architecture English Language 1 and English Language 2 for students of Electrical Engineering and Information Technology
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	13.11.2011.
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	English language for special purposes (Facultyof Philosophy

teacher of similar courses (name title of course, study programme where it is/was offered, and level of study programme)	Split) English language 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,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	**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	**Branko Blagojević, professor**
The course he/she teaches in the proposed study programme	**Advanced marine vehicles, Ship structural reliability, Resistance of high-speed ships, Composite ships**
GENERAL INFORMATION ON COURSE TEACHER	
Address	Ruđera Boškovića 9
Telephone number	091 430 5995
E-mail address	bblag@fesb.hr
Personal web page	www.fesb.hr/~bblag
Year of birth	1968.
Scientist ID	212434
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, 07.2015.
Area and field of election into research or art rank	Technical sciences, Naval Architecture.
INFORMATION ON CURRENT EMPLOYMENT	
Institution where employed	Faculty of electrical engineering, mechanical engineering and naval architecture
Date of employment	1996.
Name of position (professor, researcher, associate teacher, etc.)	Professor
Field of research	Naval architecture (Structure, Hydrodynamics, Design of Advanced Marine Vehicles, Composite Ships)
Function	
INFORMATION ON EDUCATION – Highest degree earned	
Degree	PhD
Institution	Faculty of mechanical engineering and naval architecture
Place	Zagreb
Date	2005.
INFORMATION ON ADDITIONAL TRAINING	
Year	2007.
Place	Lisbon, Portugal
Institution	Instituto Superior Tecnico (IST)
Field of training	Reliabiliy and safety of ship stuctures
Year	2008. – 2009. and 2012.
Place	Stokcholm, Sverige
Institution	Royal Institute of Tehcnology (KTH)
Field of training	Composite ships, High-speed ships hydrodynamics and structural design.
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	Swedish (2)

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 at FESB for: - Ship structural design. - Advanced marine vehicles and high-speed ships. - Resistance and propulsion/ Ship Hydrodynamics. - Composite ships. - Offshore structures. - Boat and Yacht Design.
Authorship of university/faculty textbooks in the field of the course	– Blagojević B, Dario B. VISIO. Textbook/manual. ISBN: 978-953-290-003-3, FESB, 2008. – Blagojević B. Structural design of composite ships. Textbook, 2012. https://elearning.fesb.hr – Blagojević B. Computer graphics in ship design. Textbook, 2011. FESB, https://elearning.fesb.hr – Blagojević B. Ship resistance and propulsion. Textbook, 2010. FESB, https://elearning.fesb.hr – Blagojević B. Manual for calculation of ship resistance. Manual, 2006. FESB, https://elearning.fesb.hr – Blagojević B. Manual for calculation of ship propulsion. Manual, 2006. FESB, https://elearning.fesb.hr – Blagojević B. Manual for hull form design. Manual, 2001. FESB, https://elearning.fesb.hr
Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)	– Bašić J, Blagojević B. Hydrodynamic performance of autonomous underwater vehicle with a swivel tail // Towards Green Marine Technology and Transport / CRC Press, 2015. 3-10. – Garcia-Amorena, David-Oscar; Blagojević B. The Concept of Hydro Life Ship Propulsion // International Journal of Advances in Engineering and Technology, 2015, 8 (2). – Medaković J, Ban D, Blagojević, B. A Comparison of Hull Resistances of a Mono-Hull and A SWATH Craft // International Journal of Engineering, Science and Innovative Technology. 2 (2013), 4; 155-162. – Blagojević B, Žiha K. Robust structural design based on event-oriented system analysis // Advanced Shipping and Ocean Engineering International Journal of Shipbuilding Engineering Research. 1 (2012), 1; 1-7. – Blagojević B, Bašić J. Design of a high speed craft with hybrid propulsion. // Journal of Marine Sciences (Naše more). 60 (2013) , 5-6; 91-96
Professional and scholarly articles published in the last five years in subjects of teaching methodology and teaching quality (5 works at most)	– Blagojević B, Ban D, Ljubenkov B, Jadrešić K. Integrated Active Learning in Naval Architecture Studies // Proceedings of 21st Symposium on Theory and Practice of Shipbuilding / Rijeka, 2014. 565-573. – Blagojević B, Kuttenkeuler J. On project based learning in traditional engineering studies // Proceedings of XIX Symposium on theory and practice in shipbuilding Sorta 2010. / Split, 2010. 497-509. – Guedes Soares, C, Parunov J, Blagojević B, Grubišić R, Zamarin A, Žiha K, Ehlers S, Klanac A, Tokić G. Experience and Sustainability of International Curriculum Development in Naval Architeture, Zagreb, Fakultet strojarstva i brodogradnje, 2010.

	(ISBN: 978-953-7738-00-6).
Professional, science and artistic projects in the field of the course carried out in the last five years (5 at most)	– Autonomous adaptive control of unmanned marine vehicles. 2013. - – The Design Process of high-speed craft. 2010. – 2013. Funded by: Swedish Defence Matériel Administration. – High speed craft in waves. Trajanje projekta: 2008. – 2011. Funded by: Swedish Defence Matériel Administration. – Explicit FE modelling of fluid-structure interaction. 2008. – 2011. Funded by: Swedish Defence Matériel Administration. – Determination of safety factors for ships and off-shore structures. 2006 – 2012. Funded by: Croatian Ministry of Science – Advanced Ship Design for Pollution Prevention. 2006 – 2010. Funded by EU Tempus programme.
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?	– 'Training for teachers and administration staff'. EU project ME4CataLogue, 2014. – Seminar/workshop 'Application of the CDIO (Conceive Design Implement Operate) method in engineering studies'. 2012.
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	**Frane Vlak, Ph. D., Full Professor**
The course he/she teaches in the proposed study programme	Strength of Ships
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)	1.
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	**Vedrana Cvitanić, Ph. D., Associate Professor**
The course he/she teaches in the proposed study programme	Technical Mechanics 1, Mechanics of Materials
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 where it is/was offered, and level of study programme)	Mechanics 1 - Industrial Engineering, Undergraduate study programme, FESB Technical Mechanics 1 - Mechanical Engineering, Naval Architecture, Professional study programme, FESB

	Mechanics of materials - Mechanical Engineering, Naval Architecture, Professional 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	**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	**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	Dražen, Živković: Lijevanje, ISBN 978-953-6114-91-7

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. 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	**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 teacher passed exams in/acquired the methodological-psychological-	„Training for administrative and educational personnel“ part of the EU project ME4CataLOgue (Mechanical Engineering for Catalogue)

didactic-pedagogical group of competences?-pedagoške kompetencije?	
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	**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	1. Bosnić, Juraj Alojzije; Petrović, Goran; Malarić, Roman.

articles published in the last five years in the field of the course (5 works at most)	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	**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	**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)	2. HRZZ Istraživački projekt: Mjeriteljska infrastruktura za pametne mreže, 2015. - 2018. 3. LLP - ERASMUS: Strategic Alignment of Electrical and Information Engineering in European Higher Education Institutions, 2012. -2014. 4. 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	**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	**Dario Ban, Ph. D., Assistant Professor**
The course he/she teaches in the proposed study programme	Ship Hull Forms, Hydrostatics and Stability, Project, Croatian Shipbuilding Heritage, Rules and Survey of Building Ships
GENERAL INFORMATION ON COURSE TEACHER	
Address	Antuna Gustava Matoša 11, 21000 Split
Telephone number	021 305994
E-mail address	darioban@fesb.hr
Personal web page	
Year of birth	1968
Scientist ID	213451
Research or art rank, and date of last rank appointment	Scientific associate, 24. 10. 2012
Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment	Assistant Professor, 23. 01. 2013
Area and field of election into research or art rank	Technical Sciences, Naval Architecture.
INFORMATION ON CURRENT EMPLOYMENT	
Institution where employed	Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture (FESB), University of Split
Date of employment	2006
Name of position (professor, researcher, associate teacher, etc.)	Assistant Professor
Field of research	Naval Architecture
Function	
INFORMATION ON EDUCATION – Highest degree earned	
Degree	PhD
Institution	Faculty of Engineering
Place	Rijeka, Croatia
Date	2012
INFORMATION ON ADDITIONAL TRAINING	
Year	1998
Place	Udine,Italija
Institution	International Centre for Mechanical Sciences (CISM)
Field of training	Neural networks
MOTHER TONGUE AND FOREIGN LANGUAGES	
Mother tongue	Croatian
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	English, 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)	Course instructor on undergraduate baccalaureate studies of Naval Architecture (140) courses: "Ship Geometry", "Ship Hydrostatics and Stability", and "Small Ships Design". Course instructor on post-graduate studies of Mechanical Engineering (330) for: "Meshless computational methods" and "Offshore objects development"

Authorship of university/faculty textbooks in the field of the course	1. Blagojević B, Dario B. VISIO. Internal script. ISBN:978-953-290-003-3, FESB, 2008. 2. Ban D. Geometrija broda (Ship Geometry). Lectures, 2014. https://elearning.fesb.hr 3. Ban D. Plovnost i stabilitet broda (Ship Hydrostatics and Stability). Lectures, 2013. FESB, https://elearning.fesb.hr 4. Ban D. Osnivanje broda (Ship Design). Predavanja, 2013. Internal scripts
Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)	1. Ban, Dario; Bašić, Josip; Dobrota, Đorđe. Split TSHD Hydrostatic Particulars Calculation for Cargo Discharge Phase using Polynomial Radial Basis Functions, Journal of Maritime Science and Application, Springer 2017. 2. Ban, Dario; Ljubenkov, Boris. Global ship hull description using single RBF, Towards Green Marine Technology and Transport (IMAM 2015), Edited by C. G. Soares, Roko Dejhalla and Duško Pavletić, CRC Press 2015. 3. Ban, Dario; Bašić, Josip. Analytic solution of basic ship hydrostatics integrals using polynomial radial basis functions, Brodogradnja 66(3), 2015. 15-37. 4. Ban, Dario; Blagojević, Branko; Čalić, Bruno. Analytic solution of global 2D description of ship geometry with discontinuities using composition of polynomial radial basis functions, Brodogradnja 65(2), 2014. 1-22. 5. Medaković, Josip; Ban, Dario; Blagojević, Branko. A Comparison of Hull Resistances of a Mono-Hull and a SWATH Craft. // International Journal of Engineering, Science and Innovative Technology. 2 (2013) , 4; 155-162.
Professional and scholarly articles published in the last five years in subjects of teaching methodology and teaching quality (5 works at most)	Blagojević, Branko; Ban, Dario; Ljubenkov, Boris; Jadrešić, Klement.Integrated Active Learning in Naval Architecture Studies// Proceedings of 21st Symposium on Theory and Practice of Shipbuilding / Rijeka, 2014. 565-573.
Professional, science and artistic projects in the field of the course carried out in the last five years (5 at most)	Autonomno adaptivno upravljanje bespilotnih plovila (Autonomous Adaptive Control of Unmanned Crafts), 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?	1. "Training for teachers and administrative personel" in EU project ME4CataLogue, 2014. 2. Seminar and Workshop on CDIO teaching method (Conceive Design Implement Operate) for implementation on FESB. 2012.
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 study programme)	• Entrepreneurship, Professional Study of Mechanical Engineering, Electrical Engineering, University of Split, Department of Professional Studies, • Entrepreneurship in the media, professional study, TV Academy, Split.

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

First and last name and title of teacher	**Branko Klarin, Ph. D., Full Professor**
The course he/she teaches in the proposed study programme	Fluid mechanics
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	1. Ninić, Neven; Klarin, Branko; Tolj, Ivan.

articles published in the last five years in the field of the course (5 works at most)	*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	**Frano Barbir, Ph. D., Full Professor**
The courses he/she teaches in the proposed study programme	Thermodynamics
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	1. D. Bezmalinović, B. Šimić, F. Barbir, Characterization of

articles published in the last five years in the field of the course (5 works at most)	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	• FESB, Heat and Mass Transfer, 4.5/5

in the last five years for the course that is comparable to the course described in the form (evaluation organizer, average grade, note on grading scale and course evaluated)	• University of Wyoming, Excellent, No grades- descriptive evaluation, Fuel Cell Engineering course, 2012,

First and last name and title of teacher	**Dražen Bajić, Ph. D., Full Professor**
The course he/she teaches in the proposed study programme	Manufacturing processes (540)
GENERAL INFORMATION ON COURSE TEACHER	
Address	Julija Klovića 16 B, 21000 Split
Telephone number	091 430 59 31
E-mail address	dbajic@fesb.hr
Personal web page	
Year of birth	1965.
Scientist ID	186 194
Research or art rank, and date of last rank appointment	Scientific Adviser, 12/4/2006
Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment	Senior Full Professor, 25/1/2013
Area and field of election into research or art rank	Technical Sciences, Mechanical engineering
INFORMATION ON CURRENT EMPLOYMENT	
Institution where employed	Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture
Date of employment	15/7/1991
Name of position (professor, researcher, associate teacher, etc.)	Professor
Field of research	Manufacturing engineering, machining, machine tools
Function	Head of Chair of Mechanical Engineering Technology
INFORMATION ON EDUCATION – Highest degree earned	
Degree	PhD
Institution	University of Zagreb, Faculty of Mechanical Engineering and Naval Architecture
Place	Zagreb
Date	17/4/2000
INFORMATION ON ADDITIONAL TRAINING	
Year	
Place	
Institution	
Field of training	
MOTHER TONGUE AND FOREIGN LANGUAGES	
Mother tongue	Croatian
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	English (4)
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	German (2)
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	
COMPETENCES FOR THE COURSE	
Earlier experience as course teacher of similar courses (name title of course, study programme where it is/was offered, and level of study programme)	**Undergraduate study:** 1. Technology 2 (150) 2. Technology 2 (130) **Graduate study:** 1. Computer aided manufacturing (261,262,263)

	2. Machine tools (261, 263) 3. Machine tools and systems (270) 4. Sustainable production (272) **Professional study:** 1. Machining and machine tools (530) 2. Computer aided manufacturing (530) **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	**Branimir Lela, PhD, Assistant Professor**
The course he/she teaches in the proposed study programme	Manufacturing processes (540)
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 where it is/was offered, and level of	**Undergraduate study:** 1. Technology 2 (130) 2. Technology 2 (150) 3. Fundamentals of technologies (140)

study programme)	**Professional study:** 1. Metal forming by deformation (530) 2. Manufacturing Processes (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)	4.7/5

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 (FESS25)
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)	Average grade for this course in the last five years: 4,48/5.

First and last name and title of teacher	**Nikša Krnić, Associate Professor, Ph. D.**
The course he/she teaches in the proposed study programme	Shipbuilding materials
GENERAL INFORMATION ON COURSE TEACHER	
Address	Ruđera Boškovića 32
Telephone number	+38521305912
E-mail address	nkrnic@fesb.hr
Personal web page	-
Year of birth	1956.
Scientist ID	122696
Research or art rank, and date of last rank appointment	Research scientist, 2011.
Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment	Associate Professor, 2011., in re-election process
Area and field of election into research or art rank	Technical sciences, Mechanical Engineering
INFORMATION ON CURRENT EMPLOYMENT	
Institution where employed	University of Split, FESB
Date of employment	1984.
Name of position (professor, researcher, associate teacher, etc.)	Associate Professor
Field of research	Production technologies
Function	-
INFORMATION ON EDUCATION – Highest degree earned	
Degree	Ph. D.
Institution	FSB, Zagreb
Place	Zagreb
Date	1999.
INFORMATION ON ADDITIONAL TRAINING	
Year	1988. – 1989.; 1992.
Place	Berlin, Njemačka
Institution	Technische Universitat Berlin, Fuege- und Schweisstechnik
Field of training	Underwater Welding; Welding
MOTHER TONGUE AND FOREIGN LANGUAGES	
Mother tongue	Croatian
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	English, 4
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	German, 4
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	French, 2
COMPETENCES FOR THE COURSE	
Earlier experience as course	Performed, proposed and upgraded more similar or new

teacher of similar courses (name title of course, study programme where it is/was offered, and level of study programme)	courses on Undergraduate, Bachelor and Graduate studies on FESB, Faculty of Maritime Studies in Split, University Dept. of professional Studies in Splitu, University of Applied Sciences in Velika Gorica, Study of Underwater Science and Technology on the University of Zadar
Authorship of university/faculty textbooks in the field of the course	1. Duplančić, I.; Krnić, N.: "Materijali 3", Split, 2011., electronic book, FESB, e – learning portal, 2. Duplančić, I.; Krnić, N.; Bajić, D.: Osnove tehnologijâ, Split, 2008., electronic book, FESB, e – learning portal 1. Krnić, N.: Additive Layer Manufacturing Based on Robotic Electric-Arc Welding and Wire Feedstock, 41st Int. Conf. on Welding – Modern Joining Processes, Development of Filler Materials and Simulations, Opatija, June 2016. 2. Krnić, N.: Suvremene laserske tehnologije obrade materijala, Društvo inženjera strojarstva Split, DISS, Split, 2012., invited lecture 3. Kordić, Z.; Krnić, N.: Trends in Application of Composite Materials for Helicopter Rotor Blades, Proceedings of 2nd Conf. on Business Systems Management – UPS 2001, DAAAM, Mostar, 2001. 4. Krnić, N.; Dorn, L.; Kralj, S.: Welding Processes in Modern Shipbuilding Industry, Proc. of the 3rd International Conf. Welding in Maritime Engineering, Hvar, Croatia, 2004, HDTZ, CWS, pp. 523 - 532, ISBN 953-96454-6-8. 5. N. Krnić, N.; Bekavac, T.: Robotic Gas Metal Arc Welding and Off-line Programming for Metal Additive Layer Manufacturing, 41st Int. Conf. on Welding – Modern Joining Processes, Development of Filler Materials and Simulations, Opatija, June 2016.
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?	ME4CataLOgoue (Mechanical Engineering for Catalogue)
PRIZES AND AWARDS, STUDENT EVALUATION	
Prizes and awards for teaching and scholarly/artistic work	Award of the Croatian Welding Society Specialisation on Technical University of Berlin and fellowship of the German Academic Exchange Office (DAAD)

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	**Boris Ljubenkov, Ph. D., Associate Professor**
The course he/she teaches in the proposed study programme	Floating objects building technology, Floating objects outfitting, Special materials and building technologies, Shipbuilding process organization, Croatian Shipbuilding Heritage
GENERAL INFORMATION ON COURSE TEACHER	
Address	Gundulićeva 38
Telephone number	091 4305997, 098 1762831
E-mail address	boris.ljubenkov@fesb.hr
Personal web page	
Year of birth	1972.
Scientist ID	215023
Research or art rank, and date of last rank appointment	Senior Scientific Associate, 15.04.2015.
Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment	Associate Professor, 15.07.2015.
Area and field of election into research or art rank	Area: Technical science, Field: Naval Architecture
INFORMATION ON CURRENT EMPLOYMENT	
Institution where employed	FESB
Date of employment	01.10.2013.
Name of position (professor, researcher, associate teacher, etc.)	Associate Professor
Field of research	Naval Architecture
Function	
INFORMATION ON EDUCATION – Highest degree earned	
Degree	PhD
Institution	FSB
Place	Zagreb
Date	2006.
INFORMATION ON ADDITIONAL TRAINING	
Year	1998.
Place	Kraljevica
Institution	Shipyard Kraljevica
Field of training	Software TRIDENT – CADDS
Year	2005.
Place	Pula
Institution	Shipyard Uljanik
Field of training	Software TRIDENT – part for shipbuilding technology
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)	1.University of Zagreb, Faculty of Mechanical Engineering and Naval Architecture Course teacher on Undergraduate, Graduate and Postgraduate Study Courses: Shipyard Management, Shipbuilding Technology and Methods and systems of shipbuilding production process 2.University of Split; Faculty of Electrical Engineering, Mechanical engineering and Naval Architecture Course teacher on Professional and Undergraduate Study

	Courses: Shipbuilding Technology, Shipyard organization and management, Ship Equipment, Shipbuilding special materials and technologies
Authorship of university/faculty textbooks in the field of the course	1. Ljubenkov B.: Shipbuilding technology – lectures, 2014., https://elearning.fesb.hr 2. Ljubenkov B.: Shipyard organization and management – lectures, 2013., https://elearning.fesb.hr 3. Ljubenkov B.: Ship equipment – lectures, 2015., https://elearning.fesb.hr
Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)	1. Juraga, I.; Stojanović, I.; Ljubenkov, B.: 'Experimental Research of the Duplex Stainless Steel Welds in Shipbuilding', Brodogradnja 65(2014)2, pp 74-85, Zagreb 2. B. Ljubenkov, K. Žiha: 'Conceptual design of shipyard for seagoing ships on the river Danube', Proceedings of the 15th Conference of the International Maritime Association of the Mediterranean, p 551-556, 13-17. October 2013, Corunna, Spain 3. S. Rudan, B. Ljubenkov, H. Senegović: 'Structural Analisys in Shipbuilding Production Process', Brodogradnja 63(2012)4, pp 336-341, Zagreb 4. K. Žiha, J. Kodvanj, B. Ljubenkov, A. Bakić, N. Dupor: 'Strength of ships 'as-built'; Proceddings of the 31th International Conference on Offshore Mechanics and Arctic Engineering OMAE2012, 10-15 June 2012., Rio de Janeiro, Brazil 5. Šestan A., Gomerčić M., Ljubenkov B., Vladimir N.: 'Measurement of Hull Deflections for Reliable Propulsion System Alignment Using Digital Photogrammetry', Proceedings of the International Conference on Innovative Technologies, p 80-83, 14-16.09.2010., Prague, Czech Republic
Professional and scholarly articles published in the last five years in subjects of teaching methodology and teaching quality (5 works at most)	1. Blagojević, Branko; Ban, Dario; Ljubenkov, Boris; Jadrešić, Klement. Integrated Active Learning in Naval Architecture Studies // Proceedings of 21st Symposium on Theory and Practice of Shipbuilding / Baška, otok Krk, 2014. 565-573.
Professional, science and artistic projects in the field of the course carried out in the last five years (5 at most)	1. Određivanje sigurnosti brodova i pučinskih objekata, Voditelj projekta: Prof. dr. sc. Kalman Žiha – FSB Zagreb, Trajanje projekta: 2007.-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?	1. 'Trening za nastavnike i administrativno osoblje' u sklopu EU projekta ME4CataLogue, FESB, 2014.
PRIZES AND AWARDS, STUDENT EVALUATION	
Prizes and awards for teaching and scholarly/artistic work	
Results of student evaluation taken in the last five years for the course that is comparable to the course described in the form (evaluation organizer, average grade, note on grading scale and course	University of Split, Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture Courses: Shipbuilding Technology, average grade 4.4 Shipyard Organization and Management, average grade 4.4 Composite Ship Construction, average grade 4.3

evaluated)	

First and last name and title of teacher	**Jani Barle, Ph. D., Full Professor**
The course he/she teaches in the proposed study programme	Floating Objects Maintenance and Repair
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 Undergraduate study: - Industrial process control (FETC06) Master's degree study:

	- Hydraulics and pneumatics(FETL17) - Maintenance management (FETL04) - Product life management (FETM06) <u>Doctorate degree study:</u> - Experimental methods (FETU24) - Reliability engineering (FETU14)
Authorship of university/faculty textbooks in the field of the course	Barle, J.: Reliability in maintenance management, (student handbook in Croatian: *Pouzdanost u funkciji održavanja tehničkih sustava*), FESB, Split, 2009
Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)	1. Barle, Jani; Đukić, Predrag; Ban, Dario. Verification of Number of Cycles for Fatique Life Estimation of Wind-Sensitive Structures // 7th ICCSM / Croatian Society of Mechanics, 2012. 233-234. 2. Barle, Jani; Wolf, Hinko; Đukić, Predrag. Experimental verification of the dynamic model for a wind turbine tower // 30th Danubia-Adria: Symposium on Advances in Experimental Mechanics / Croatian Society of Mechanics, 2013. 219-220 3. Grubišić, Vatroslav; Barle, Jani. Procedure for the Service Strength Approval of the Drillship Derricks. // Rad Hrvatske akademije znanosti i umjetnosti. Tehničke znanosti. 521 (2015), 17; 51-62. 4. Đukić, Predrag; Wolf, Hinko; Jani, Barle. Simple dynamic model of wind turbine tower with experimental verification. // International journal for engineering modelling. 28 (2015) , 1-4; 49-59
Professional and scholarly articles published in the last five years in subjects of teaching methodology and teaching quality (5 works at most)	1. Barle, Jani; Franulović, Marina; Jurčević Lulić, Tanja; Kladarić, Ivica; Markučič, Damir; Radica, Gojmir. *Izrada kataloga znanja, vještina i kompetencija za studije strojarstva u Republici Hrvatsko*j // Zbornik radova međunarodne stručne konferencije ME4CataLOgue / Kozak, D., Barle, J., Markučič, D., Pavletić, D., Matičević, G, Vranešević M. N., Rosandić, Ž, Damjanović, D. (ur.)., Sl.Brod 2015. 2. "*Hrvatski katalog znanja, vještina i kompetencija za studije strojarstva zasnovan na ishodima učenja (za preddiplomski, diplomski i doktorski studij)*", Strojarski fakultet u Slavonskom Brodu Sveučilišta J. J. Strossmayera u Osijeku, 2015., Kozak, D., Barle, J., Boras, I., Franulović,, M., Jurčević-Lulić, T., Kladarić, I., Lelas, D., Markučić, D., Matičević, G., Pavletić, D., Vranešević-Marinić, N.(ur.), ISBN 978-953-6048-78-6
Professional, science and artistic projects in the field of the course carried out in the last five years (5 at most)	
The name of the programme and the volume in which the main teacher passed exams in/acquired the methodological-psychological-didactic-pedagogical group of competences?-pedagoške kompetencije?	IPA IV project ME4CataLOgue “Further development and implementation of the Croatian Qualifications Framework (CQF)”, 2013-2015.
PRIZES AND AWARDS, STUDENT EVALUATION	
Prizes and awards for teaching and scholarly/artistic work	
Results of student evaluation taken in the last five years for the course that is comparable to the course described in the form (evaluation	

organizer, average grade, note on grading scale and course evaluated)	

First and last name and title of teacher	**Boženko Bilić Ph.D., Full Professor**
The course he/she teaches in the proposed study programme	Production Preparing and Planning
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.
Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)	1. 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 2. 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. 3. 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. 4. Bilić, B., Veža, I., Crvelin, D., *Application of the SMED method in the injection molding process*, Proceedings of the 1st International Scientific Conference on Engineering: MAT 2010 - Manufacturing and Advanced Technologies, (ISSN 1986-9126), University Dzemal Bijedic, Faculty of Mechanical Engineering, str. 123-128, Mostar, 2010.
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: 4.5

First and last name and title of teacher	**Gojmir Radica, Ph. D., Full Professor**
The course he/she teaches in the proposed study program	Marine propulsion systems
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 study programme)	Professional studies: – Thermal and hydraulic machines (430) – Marine propulsion (440)

	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.
Professional and scholarly articles published in the last five years in subjects of teaching methodology and teaching quality (5 works at most)	– Barle, Jani; Franulović, Marina; Jurčević Lulić, Tanja; Kladarić, Ivica; Markučič, Damir; Radica, Gojmir. Izrada kataloga znanja, vještina i kompetencija za studije strojarstva u Republici Hrvatskoj // Zbornik radova međunarodne stručne konferencije ME4CataLOgue / Kozak, D., Barle, J., Markučič, D., Pavletić, D., Matičević, G, Vranešević M. N., Rosandić, Ž, Damjanović D. (ur.). Slavonski Brod : Strojarski fakultet u Slavonskom Brodu, 2014. 21-30 (plenarno predavanje,međunarodna recenzija,objavljeni rad,stručni).
Professional, science and artistic projects in the field of the course carried out in the last five years (5 at most)	– Repowering motor boat 2012-13
The name of the programme and the volume in which the main teacher passed exams in/acquired the methodological-psychological-didactic-pedagogical group of competences	– Implementacije ishoda učenja u razvoj studijskih programa i kurikuluma; Povezivanje ishoda učenja i metoda poučavanja-Prof. dr. sc. Izabela Sorić, Odjel za psihologiju,Sveučilište u Zadru, i Doc. dr. sc. Slavica Šimić Šašić,Odjel izobrazbu učitelja i odgojitelja,Sveučilište u Zadru, ukupno 24 sata; u sklopu IPA IV projekt: "ME4CataLOgue - Hrvatski katalog znanja, vještina i

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

3.4. Optimal number of students

Optimal number of students is 20.

3.5. Estimate of costs per student

The cost for student per year is 20,000.00 kunas.

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 Zagreb 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 system for improving quality of FESB.</td></tr>
<tr><td colspan="2">• Quality Assurance Handbook, FESB</td></tr>
<tr><td colspan="2">Description of procedures for evaluation of the quality of study programme implementation:
• Fore 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 teaching quality and teaching through surveys (leaves).
• The poll organized by the Centre for Quality Improvement, University of Split, and conducted by the Committee for improving the quality of faculty (the Committee).
• Processing of the results of the survey conducted at the University computer.
• The survey is conducted every semester.
• The overall results of the survey presented to the Committee at the meetings of the Faculty Council. This report is published on the website of the Faculty.
All procedures are carried out according to the Regulations on the structure and role of the quality management system of the University of Split, according to the Regulations on the Procedure of evaluation of the quality of teachers and by the students of the University of Split and the Regulations on the system for improving the quality of FESB.</td></tr>
<tr><td>Monitoring of grading and harmonization of grading with anticipated learning outcomes</td><td>Committee for study programs Mechanical Engineering, Naval Architecture and Industrial Engineering monitors compliance with the assessment of learning outcomes. All procedures are performed according to the Rules of Procedure of the Faculty Council and the Council of the Institute, as the Committees for the study programs of the Faculty Council bodies and report.</td></tr>
</table>

Evaluation of availability of resources (spatial, human, IT) in the process of learning and instruction	• Student evaluation of the work of administrative and professional services and infrastructure for learning and student life through electronic surveys • Evaluation is conducted via an online questionnaire which students filled in all the years of study, except for the final • The poll organized by the Centre for Quality Improvement, University of Split, and conducted by the Committee for improving the quality of faculty (the Committee) • Processing of the results of the survey conducted at the University Computer • The survey is conducted every year • The survey results presented at meetings of the Faculty Council and published ma website of the Faculty.
Availability and evaluation of student support (mentorship, tutorship, advising)	• Students have access to administrative and professional support services in their work • Mentors are assigned to students for making the final and dissertations
Monitoring of student pass/fail rate by course and study programme as a whole	• Analysis of the student pass rate on cases and studies carried out once a year • analyzes of the studies carried out by the University in collaboration with the Board • Analysis by subjects and studies carried out by the Faculty of Management • The results of both analyzes are presented in the sessions of the Faculty Council and published on the website of the Faculty.
Student satisfaction with the programme as a whole	• Student evaluation of the work of administrative and professional services and infrastructure for learning and student life through electronic surveys • Evaluation is conducted via an online questionnaire which students complete after graduation • The poll organized by the Centre for Quality Improvement, University of Split, and conducted by the Committee for improving the quality of faculty (the Committee) • Processing of the results of the survey conducted at the University Computer • The survey results presented at meetings of the Faculty Council and published on the website of the faculty.
Procedures for obtaining feedback from external parties (alums, employers, labour market and other relevant organizations)	• Once a month, the Faculty of Management meets with the Presidency alumni • Once a year, the Days of the Faculty, organized round tables and workshops with employers and other stakeholders
Evaluation of student practical education (where this applies)	Student practice is not a mandatory part of the program. Some of the students optional job placement abroad.
Other evaluation procedures carried out by the proposer	• Once a year, carried out the Internal periodic assessment of the quality system • Every 5 years in the Self-Evaluation

	All procedures are performed according to the Manual on Quality Assurance FESB.
Description of procedures for informing external parties on the study programme (students, employers, alums)	• All the information is available on the website of the Faculty: https: //www/fesb.hr • For high school students from Split and the surrounding region are organized visits to the Faculty • Participation at the festival University • Media representation